There's a sunny greeting every night from this sign of

REG. U. S. PAT. OFF.

SCOTCHLITE

BRAND

REFLECTIVE SHEETING

IMPORTANT NIGHTTIME VISIBILITY for this colorful Arizona entrance sign is provided by "SCOTCHLITE" Reflective Sheeting. Its friendly greeting is impressive by day—beautiful at night as car headlights light up its warm, vivid colors.

Welcoming signs of "SCOTCHLITE" Sheeting work right around the clock on every highway entrance to Arizona, proclaiming the hospitality of this progressive state.

If you would like to make your entrance signs brighter and friendlier, why not get full information on "SCOTCHLITE" Sheeting—the modern sign material for modern high-ways.

MANY TIMES BRIGHTER than conventionally-painted signs, this warning of "SCOTCHLITE" Sheeting lights up at night in true *color*, true *size*, true *shape*. No other product offers this dependable, life-saving service.

MORE INFORMATION? MAIL THIS COUPON TO:

Minnesota Mining & Mfg. Co.
St. Paul 6, Minn., Dept. TE-63

We would like more data on how "SCOTCHLITE" Sheeting can help us make more colorful, more effective signs.

Name.....

Address.....

City.....Zone...State.....

REG. U. S. PAT. OFF.

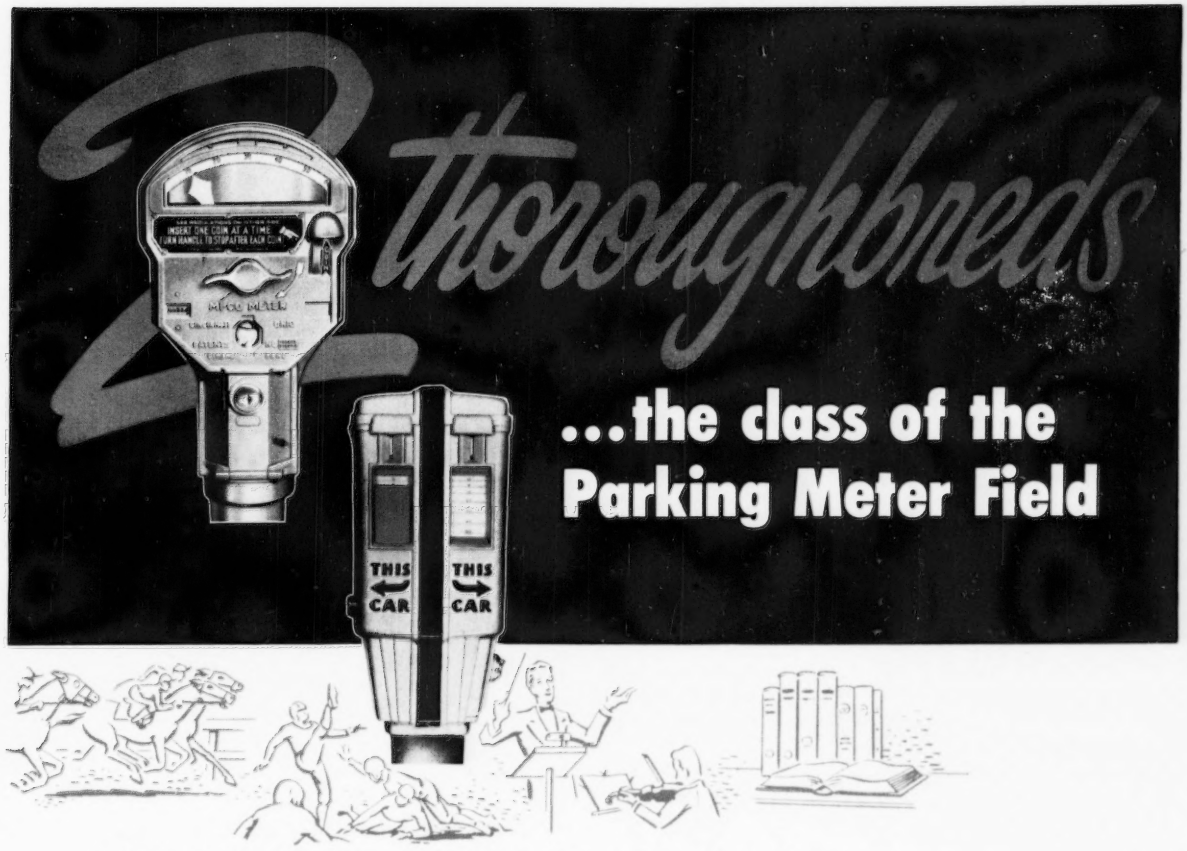
SCOTCHLITE

BRAND

REFLECTIVE SHEETING

Made in U.S.A. by Minnesota Mining & Mfg. Co., St. Paul 6, Minn.—also makers of "SCOTCH" Brand Pressure-Sensitive Tapes, "Scotch" Sound Recording Tape, "Underseal" Rubberized Coating, "Safety-Walk" Non-Slip Surfacing, "3M" Abrasives, "3M" Adhesives. General Export: 122 E. 42nd St., New York 17, N.Y. In Canada: London, Ont., Can.

3M COMPANY



Whether it's horse racing, athletics, music, literature, art or any other endeavor, class dominates the field. And the parking meter field is no exception. Here MI-CO Meters stand out head and shoulders over all the others, and justifiably so, as service records prove.

In the design and construction of the MI-CO Manual and the original time-tested MI-CO Twin Automatic, we believe we have virtually achieved parking meter perfection. This is no "pipe dream" or idle boast, because performance records from literally hundreds of installations in this country and foreign lands confirm our belief.

MI-CO Parking Meters are doing an outstanding job everywhere. They cost less to maintain, are seldom out of order, and have proved consistently high earners over long periods of time. Furthermore, wherever installed, they have the unqualified endorsement of motorists, merchants and city officials.

We invite you to write for MI-CO reports. Compare them with the records of other makes of meters, and then draw your own conclusions. Chances are you too will be convinced that MI-CO Meters are the class of the parking meter field.

And whether your plans call for on-the-street or off-the-street parking —single meters or twins, manually operated or automatics—there is a MI-CO to meet all the requirements.

Write for fully illustrated literature and performance records. Compare, and then decide. You can't go wrong with MI-CO's.

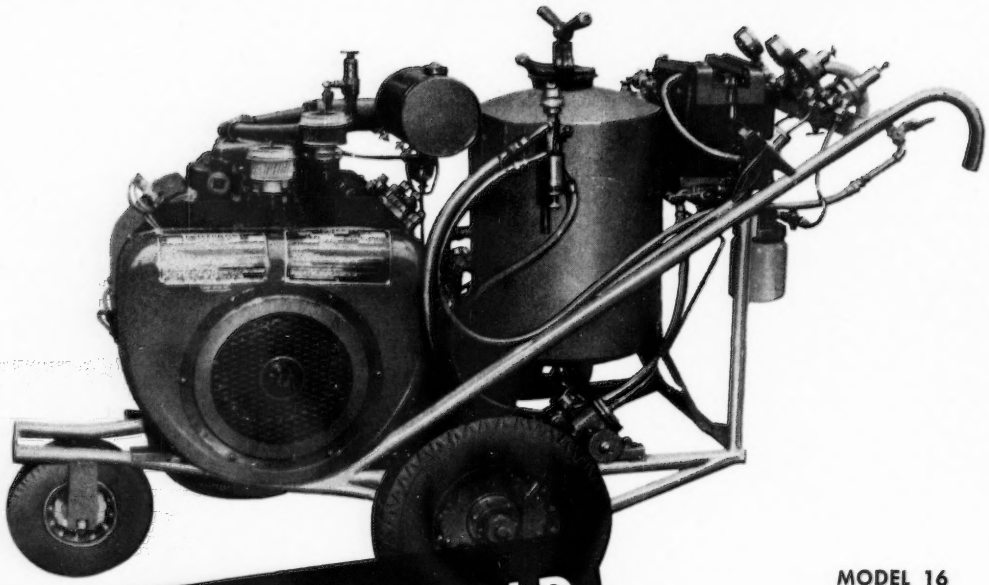
MI-CO METERS, 231 Court St., Covington, Kentucky

Division of The Michaels Art Bronze Co., Inc.

MICHAELS PRODUCTS:

Store Fronts
Lettering
Check Desks
Lamp Standards
Marquees
Tablets and Signs
Name Plates
Astragals
Railings
Grilles and Wickets
Kick and Push Plates
Push Bars
Thresholds
MI-CO Parking Meters
Museum Trophy Cases
Bronze and Aluminum Doors
Bank Screens and Partitions

WHEN EVERY SECOND COUNTS



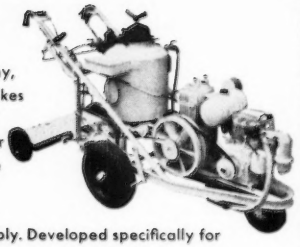
MODEL 16

You can count on WALD REFLECTO-LINER

When a highway requires application of a double center-line, this medium-duty Two-Line Striping Machine is your best *time-saving* answer! The Model 16 Reflecto-Liner is designed especially for even application of ***two lines,*** simultaneously . . . specifically engineered to properly apply heavy viscosity reflective marking materials so that maximum durability is obtained!

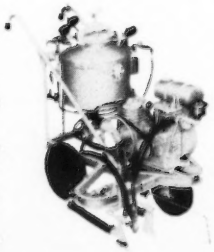
Yes, the self-propelled Model 16 streamlines your double-striping projects . . . eliminates cumbersome equipment . . . reduces application costs . . . does the job in half the time! The outstanding advanced design features are your positive assurance of unequaled operational efficiency and economy.

MODEL 12



Used by the U. S. Army, cities, highways, turnpikes the country over! No striping job too big for this superior single line self-propelled Striper with the 100% safety factor in air supply. Developed specifically for applying reflective marking materials—heavy or light—with maximum ease and efficiency.

MODEL 8



Single line municipal Striper designed to handle all traffic marking materials with dependable results. Specially designed for easy operation on urban streets, for marking hard-to-reach areas.

WALD INDUSTRIES, INC.
HUNTINGDON, PA.

REFLECTO-LINER

Traffic Engineering

OFFICIAL PUBLICATION OF THE INSTITUTE OF TRAFFIC ENGINEERS

VOLUME XXIII | JUNE, 1953 | NUMBER 9

COVER: An underground garage is being built by the Chicago Park District that will have a capacity of 2359 cars. It will be a two level affair and will be located beneath World's Famous Michigan Avenue and Grant Park. The garage is being built in two stages of construction. As shown the portion beneath Michigan Avenue (from lower left corner to upper right corner) is being constructed first; this required the building of a six-lane by-pass roadway around the construction site. After traffic is restored to Michigan Avenue the portion of the garage beneath the temporary roadway will be constructed. The present Monroe Street Parking Lot is shown in the upper portion of the photograph.

Traffic Engineering is that phase of engineering which deals with the planning and geometric design of streets, highways, and abutting lands, and with traffic operation thereon, as their use is related to the safe, convenient, and economic transportation of persons and goods.

INSTITUTE OFFICERS

F. BRUCE CRANDALL
President

DONALD M. MCNEIL
Vice-President

HARRY PORTER, JR.
Vice-President

CHARLES W. PRISK
Secretary-Treasurer

PUBLICATION STAFF

M. MANSFIELD TODD
Editor

Associate Technical Editors
ROBERT S. HOLMES, EDMUND R. RICKER
MARTIN C. STARK

Associate Editors

H. A. BARNES
H. M. BATTS, JR.
J. A. CARROTHERS
C. C. CLARK
R. H. HARLESTON, JR.
C. S. LECRAW, JR.
EUGENE MAIER
S. T. SIEGEL
NORMAN KENNEDY

May We Offer . . .

Traffic Engineering in Montreal 303
Adrien Genest
Traffic Trends 305
A Traffic Plan for Buffalo 306
Charles R. Waters
Some Aspects of Metropolitan Area Transportation Problems 308
Harmer E. Davis
Open Discussion 315
Charles Adler, Jr.
Reference Notes 316
Douglas J. Carmody
Traffic News 317
Letters to the Editor 324
Looking Ahead 325
Section News 326
On the Shelf 331
Secretary's Column 332
Position Available 332
Index to Advertisers ..... Inside Back Cover

Published Monthly by the

Institute of Traffic Engineers

PUBLICATION office:
Interstate Printing Corp.
400 Watchung Avenue
Plainfield, New Jersey

EDITORIAL AND ADVERTISING offices:
Strathcona Hall
New Haven 11, Connecticut

Entered as second-class matter November 7, 1941, at the Post Office at Plainfield, New Jersey, under Act of March 3, 1879. ¶Single copies 40 cents, subscription price $3.50 per year in the United States; $4.75 per year to foreign countries. Other publications of the **Institute of Traffic Engineers** include Annual Proceedings, Traffic Engineering Handbook and Technical Bulletins. **¶The Institute is not responsible for any statements made or opinions expressed in its publications. Publication of advertising does not constitute Institute approval or endorsement of the products or services advertised.** Permission to reprint contents with customary credit line is given unless otherwise stated.

DUAL EFFICIENCY BOOSTS INCOME

✓...the Seth Thomas Movement makes a BIG difference

6 REASONS WHY DUALS stand the "gaff" and give better service longer!

✓ **1. SETH THOMAS CLOCK MOVEMENT...** Backed by the world's most famous fine clock maker.

2. STAINLESS STEEL COIN MECHANISM ... Smoother running in all weather conditions.

3. WEATHERPROOF HEAD... With handy work-shelf door.

4. SUPERIOR DESIGN... Discourages cruising; time indicator visible only from sidewalk side.

5. ON-THE-STREET TIME-AND-COIN CONVERSION... To meet changing traffic conditions.

6. EASY TO PATROL AND OPERATE... Observation window shows slug or tampering at a glance. No levers to move.

EFFICIENCY, a BIG Dual advantage, means more income from Dual Parking Meters as shown in surveys. This extra margin of income is paying off for cities everywhere!

One reason for Dual efficiency is the meter's superb timing device, made by one of the leading manufacturers of timing movements—Seth Thomas. This precision clock is the heart of every Dual Automatic.

In addition, the coin mechanism in Dual Automatics is the last word in smooth action. This superior stainless steel unit will operate for years and years at top efficiency in extremes of hot or cold weather, in dusty or humid atmospheres. And Dual *gearshift* meters have the extra advantage of on-the-spot time-and-coin conversion to meet changing traffic conditions, plus one side time dial that discourages cruising.

Whether it's the new Dubl Dual or the single head Dual, you get extra dependable, profitable operation—automatically. *Remember,* you can't buy Dual *quality* and revenue-building efficiency at a lower price. Write for Bulletin DU-521 for on-street parking; Bulletin DU-522 for off-street parking.

Single head and Dubl Dual meters have the same efficient automatic mechanisms—one in the single head; two independent mechanisms in the Dubl Dual.

THE DUAL PARKING METER COMPANY

A subsidiary of The Union Metal Manufacturing Company

Canton 2, Ohio

Frankly Speaking

REGARDLESS OF currently accelerated highway improvement programs, we are going to have to get along with deficiencies and inadequacies for a long while. In the meantime, highway transportation must continue to function. This is the responsibility of the traffic engineer. Of course he cannot provide new and modern facilities, but that is no reason why nothing can be done. To be sure, the methods at the engineer's disposal are limited, but even with what is available he can accomplish much toward improving traffic operation on the existing highways.

There is always some phase or detail of the operation of any road or street, or of any system of roads or streets, that can be improved. It is the traffic engineer's responsibility to locate the snags that are impeding or confusing traffic on the highway and, once they have been found, he will discover somewhere in his own experience or in the experience of the profession, an answer and a remedy.

The greatest obstacle to many improvements is the resistance sometimes encountered when changes are to be made in the traffic pattern which are essential to the improvement of traffic conditions. Some of the most efficient techniques and methods available to the traffic engineer are specifically aimed at radically modifying the existing practices of motorists. However, many important and influential people feel they have a proprietary interest in the existing pattern. They want things left as they are, and will make every effort and use every pressure to keep them that way, and, if the traffic engineer is going to do a good job he cannot afford to be turned aside by these minority groups.

I am not suggesting that the traffic engineer start a crusade to antagonize anyone who is honestly open to argument. I am saying that he should campaign aggressively against traffic conditions that are open to remedy. Such a campaign can be organized and pressed home on the basis of good engineering principles, good judgment, and sound sense of public relations.

The engineer should analyze conditions thoroughly, select the methods that will best serve to improve these conditions, then use his best ingenuity to get the backing of local officials and the public. If, as is not unlikely, he bumps up against opposition by rugged and contrary individualists, these people should be convinced, if possible, that the improvements are for the best interests of the community as a whole, and not for just a few. Even if he doesn't succeed, his efforts will help to win the support of others.

For years the traffic engineer has been taking care of the day-by-day demands necessary to keep our aging pavements and structures carrying traffic until their turn for improvement comes up in the long cycle of highway construction, deterioration and reconstruction. In doing this he has accumulated a pretty good kit of tools and a certain amount of skill in their use. He has learned many of the answers as a result of his experience in meeting repeated emergencies. However, the traffic engineer can no longer hope to keep on top of his job merely by meeting emergencies as they arise. If he is to handle his job at all he has to get ahead of it by creating, in advance, better operating conditions which will tend to forestall emergencies. He should make up his mind not to be a mere trouble-shooter and to take on his real job as the designer of more efficient operating conditions and patterns.

The main thing is to realize that this task—making today's roadways do today's work—is the really constructive part of the traffic engineering function. Not only does it produce improved results until new facilities can be constructed—it may even point the way toward more practical and economical methods of providing adequate service to the ever increasing traffic.

If the engineer thoroughly understands the basic importance of this phase of his job, he will not be deterred in starting it by the knowledge that he probably will encounter some opposition. Once having started, he will not be too ready to "throw in the sponge" when the going gets tough. The time has come to prove that the traffic engineer is something more than a mere trouble-shooter —that he can and does contribute real, immediate, and often lasting betterments to the operation of the most basic service of our times—highway transportation.

Director

Put Night Time Magic in your Signs

with the NEW PRISMO

"Rain-Proof"

REFLECTO-KIT

"Moisture-Proofed" for Greater Efficiency!

GREATER BRILLIANCE!

By far, the best reflective material for all types of traffic signs and markers! The combination of improved plastic binder and myriads of tiny glass spheres—so fine, so evenly graded—results in powerful brilliance beyond compare. Out-shines all others, even in a downpour, because the Rainproof Reflecto-kit is chemically treated, by an exclusive Prismo process, to resist moisture!

LONGER LIFE!

Proved longest-lasting, in test after test, under all weather conditions. No dull smudging or grey marks, even after long use. The uniform sphere composition results in tighter adhesion with the strong plastic binder. A reflective surface that can't be beat for permanency!

GREATER ECONOMY!

Easy to apply, in the field or shop. No cutting or trimming waste. Will coat any type of vertical surface . . . efficiently . . . regardless of contour. Spreads evenly, in dampest weather. Initial cost is low and no maintenance is required . . . for years!

PRISMO

SAFETY CORPORATION

HUNTINGDON • PENNSYLVANIA

Traffic Engineering in Montreal*

By Adrien Genest (Mem., ITE)
Traffic Engineer, City Planning Department, Montreal, Quebec, Canada

In April 1951, I had the pleasure of being invited to address this group on the important subject of the traffic problem in Montreal. I believe that you will now be interested to hear of the positive steps which have been made since that date toward the improvement of the situation and the solution of the problem itself.

Let us first explain the technique of the traffic surveys undertaken by the City Planning Department; then, we will see if the results obtained should indicate the proper measures to be taken in connection with the desirable solution. What is the scope of such surveys?

First of all, a conclusion logically follows some premises. These are the facts and data which have to be gathered from counts and various information, and the results must be scientifically analyzed.

Any other basis for improvement of the circulation is a haphazard and uneconomical procedure. Every city has a peculiar traffic situation and with today's masses on wheels, I may add that any such situation constitutes a problem for all cities of a certain importance. The annual counts give a moving picture of the traffic conditions and allow us to determine methodically the movements of the population, i.e., the trends of the circulation, together with the development of the city.

Traffic surveys should be conducted by technicians only, and they are the indispensable tools used in the solution of a traffic problem. In other words, it cannot be the layman's job to be the judge as to what is the proper solution to a technical problem. Today, the horse and buggy era being ended, traffic problems are jobs for specialists and will be solved only by those having the necessary data at hand.

Here is now, as briefly as possible, the technique we have followed in the organization of our traffic surveys.

Our basic traffic studies have consisted chiefly in volume counts, determination of traffic density and a parking survey. We have made also other various studies, viz: Cordon counts, observations of speed, Speed and Delay studies, Origin and Destination surveys and several others of which, unfortunately, the time allotted to me will not permit the description.

Volume Counts

For counting traffic, we use the standard Short Count Method which is generally accepted throughout the United States.

The whole downtown area, i.e., the central business district, extended as far as Atwater Avenue in the west and Frontenac Street in the east, was divided into 14 zones, each of similar characteristics within its limits, viz.: the administration district, finance and business, hotels and railway stations, the warehouse district, the east and west retail store districts and a few zones of mixed character.

A well chosen intersection in each zone is used as a control station for all the base stations of the zone. Moreover, one of the main intersections of the business center is selected for its special characteristics as giving the best picture of the circulation in the district. This intersection is called the master station and acts as a common denominator for the whole district. It is used to adjust all the control stations for a given day and consequently all the base stations in the different zones. For this reason, this intersection needs to be counted for at least 12 hours during a certain period and, in general, during typical hours, every day where a count is made elsewhere in the city. To facilitate comparison, all counts are brought to the basis of an average weekday. Vehicles are always counted by half-hours and divided according to types, i.e., passenger cars, trucks and buses, and tramways. Motorcycles, bicycles and horse-drawn vehicles are not counted. For comparative purposes, also, it is especially the peak hour of the average weekday which is generally considered.

One may ask about the degree of accuracy of the Short Count Method. I answer that experience has proven the error not to exceed 10%. For example, in the case of Snowdon Junction, the Montreal Tramways Company made counts in 1947 which showed a difference of 1% with ours. Now, if we consider that we have used 10 to 12 men to cover in two months as vast a territory as, say 200 men would have done using the common or ordinary method, it is easy to understand the reason for our choice.

Volume counts were also made outside the center of the city, at strategic points, i.e., at bridgeheads and at the most important intersections especially those located on all the access ways to the center.

Density Studies

Density of traffic is derived from volume counts. The latter may show the importance of a street or of an artery compared to another, but they do not give the true traffic conditions as they are no indication of congestion. By definition, the density of traffic equals the number of vehicles traveling on a street or roadway by traffic lane-hour. If we consider 11 feet to be the standard width of a traffic lane, a pavement may have say three, four, six lanes, but it does not mean that they are free lanes. A parking lane is no traffic lane. The efficiency of the latter is in proportion to the type of vehicle using it. A tram car occupies more space than a bus or truck and the latter more than a passenger car. Angular parking effects two lanes. Capacity and efficiency are also influenced by the grade or degree of slope, the existence of traffic lights, of an unusual pedestrian traffic at cross-streets, by the number of intersections, etc.

All these factors must be considered if the density of traffic on a given roadway is to be determined adequately. Density studies constitute the proper means of obtaining the necessary information with regards to the real cause of

*An address to the Young Men's Section of the Montreal Board of Trade, February 11, 1953.

a traffic problem, the urgency of a local improvement as the widening of a roadway, etc.

Parking Survey

Parking constitutes one of the two main elements of any urban traffic problem. It would be a fine thing to provide for fluidity of movement of our motor cars, but where will they park? Every motorist attracted to Montreal must stop or park somewhere. With today's business concentration and consequential density of moving vehicles, this parking need has created a problem, the acuteness of which is in inverse proportion to the distance from the center. Since the primary requirement of a roadway is to assure facility of movement, off-street parking must be provided in addition to the unrestricted part of the curb.

The scope of our parking survey was to inquire into the parking situation to determine the deficiency in necessary spaces, and to localize the missing garages and parking lots.

The surveyed area was the business center of the city, i.e., the territory bounded by Guy, Sherbrooke and Saint-Hubert Streets and the Saint-Laurent River, plus a small area between Saint-Hubert and Amherst Streets to include large departmental stores of Sainte-Catherine Street.

The whole district was divided into ten zones in which parking conditions were assumed to be identical. They are about the same as for volume counts, except that the area to be surveyed was only a part of the downtown area.

Here is the procedure we followed in counting the parked vehicles during eight hours every day, from 9:00 A.M. to 5:00 P.M. Each observer was designated a route or continuous circuit which he had to follow in little less than half an hour, noting on special field sheets the license numbers of the parked vehicles, their type, and also the violations of the parking regulations with regard to location and position along the curb.

The data gathered in this survey have permitted the establishment of a complete inventory of the parking situation in the central district. The number of parkers and repeaters at each half-hour have been determined, as well as the duration of parking, the number of over-time and day-long parkers, the number of spaces available at the curb, the curb turn-over, and congestion factors indicating the deficient blocks in connection with parking facility together with the degree of congestion for each block.

Regarding off-street parking, the observations were made at each hour, during the same period of eight hours. The information noted on field sheets concern the capacity, the occupation, the physical layout and the fees charged. Finally, the actual parking needs have been determined to such an extent that it has been possible to make provision for the future. The ultimate result of the survey was the laying out of a Parking Master Plan which takes care of the needs for several years to come.

Our Traffic Problem

The traffic surveys have permitted the determination of all the elements of our traffic problem. They are then at the base of our policies regarding local and general improvements, short and long-term realizations; in one word, they provide some necessary tools which will help in meeting with the requirements of the city and community master plan. The following are examples of the utility, of the practical results of our surveys in connection with the above statement.

Volume counts have shown the relative importance of our arteries, determined the actual truck routes and the concentration of tramway lines, the influence of taxis on downtown traffic, etc.

The Density Map shows where there is congestion, indicating accurately the bad spots where traffic jams take place.

This map also emphasizes the effects of the narrowness of the downtown area, the western part of it being squeezed between the mountain and the river. As a consequence, the map indicates high traffic concentration upon east-west arteries while the inverse is shown for the north-south arteries.

Speed and Delay Surveys give a measure of the efficiency of traffic lights on a given artery from the standpoint of having an orderly traffic flow. They point out the causes of low regime or operating speed on our arteries and the consequential delays, together with their relative importance.

At last, the analysis of the results of our surveys have led to the establishment of a programme of homologations in view of expropriating when it becomes necessary. Some old homologated lines have already been revised and new ones decided upon.

[In Canada "homologation" means approximately the same as the "legal establishment" of a right of way for public use in the United States.—EDITOR.]

Positive Steps Toward Improvement

I should, at this time, like to tell you of some positive steps which have been taken to improve the traffic situation since our last surveys in 1949.

I said earlier that the annual counts are the tools which are used to compile the data necessary to find and apply the needed solutions. Up to 1949, we had a temporary set-up composed mainly of students employed in summer time to perform the task. It is our hope that a permanent organization or survey unit will be established in the near future for this purpose. This organism would be but one function of a Traffic Section within the framework of the Master Plan. In fact, such a Traffic Section should be the first step towards the establishment of an adequate Traffic Engineering organization which would coordinate all activities actually performed by several city departments, viz.: the City Planning, Public Works and Police Departments, the Sub-Committee on Traffic and Parking of the Executive Committee, the Advisory Committee of the Police Department, etc. Enforcement, of course, would still be performed by the Police Department.

When I had the opportunity of presenting an analysis of our traffic situation before this group in 1951, I concluded that the most efficient means of solving such a problem would be the following:

1. To complete, correct and improve our street network;
2. To provide off-street parking in the central area;
3. To replace tramways by buses;
4. To build properly located expressways;
5. To improve our mass transportation system.

1. To Complete, Correct and Improve Our Street Network

Exclusive of the mere widenings of certain streets, let us mention a few important street openings, or simply positive steps towards similar realizations:

Clark Street—The opening of this street above Sherbrooke makes it a continuous N.-S. thoroughfare parallel to Saint-Urbain which would offer an opportunity of establishing a pair of efficient one-way streets from Craig Street to the C.P.R. tracks at Van Horne.

University Street—Its prolongation south of Dorchester, when extended as far as Saint-Paul and Block's Bridge,

will provide a new North-South artery in a district of high concentration.

Berri Street—Now homologated in view of the construction of a tunnel under Sherbrooke Street.

Burnside-Saint-Luc—No doubt that the connection between these two streets should be completed as already homologated as soon as possible.

Dorchester Street—This street, in the process of expropriation, will become within a few years the main east-west artery through the middle of the business district.

Windsor-Colborne—the missing link of Windsor Street between Saint-Jacques and Notre-Dame, will at last, be completed next summer.

McGregor Street—Its prolongation from Simpson to McTavish and Pine will provide a new street parallel to Sherbrooke.

Cavendish Avenue—The new tunnel, under construction under the C.P.R. tracks, will assure a new connection between Upper Lachine Road and Sherbrooke Street.

Namur Street—Its opening between Décarie Boulevard and Côte-des-Neiges Road and its connection to Jean-Talon will provide a new street in a very congested area.

Mount-Royal and Marie-Anne Streets East—The extension of these two streets east of Frontenac and their connection with Rachel have helped traffic a great deal in this part of the city.

Christophe-Colomb—The construction of the tunnel, started recently, will complete an important artery east of Saint-Hubert.

The above very important projects, already realized or more or less near completion, constitute positive steps towards traffic congestion relief. There are also several improvements to intersections like Côte-des-Neiges-McGregor and Jean-Talon-Lajeunesse, which will help in this connection in the near future.

2. To Provide Off-Street Parking in the Central Area

Our 1946-1947 parking survey was preliminary. Its main result was the Parking Master Plan which constitutes a very handy tool as long as it does not stay on paper. We made another step last year when, furthering our study, we were led to more positive results by plotting exactly on the map the necessary off-street garages and parking lots. To start with, Chaboillez Square will provide, probably next Summer, 222 properly designed parking stalls, with parking meters. Moreover, two well located lots have been homologated, and some others will be homologated for the same purposes. On the other hand, on-street parking will be helped, where permissible, by the installation of parking meters which will increase the curb turnover.

3. To Replace Tramways by Buses

It would be superfluous to comment upon such an improvement since its advantages are obvious. Everyone can already see the improvement which this replacement made on Saint-Laurent Boulevard. In short, the circulation on this thoroughfare is now nearly fluid and I believe that volume counts would prove that capacity has about doubled as compared with previous figures. Doubling the capacity of a thoroughfare should mean 100% improvement. It is a fact that much new traffic has been induced to use Saint-Laurent Boulevard, which travelled formerly on streets parallel to this artery. Mass transportation also has increased to a great extent. According to the Montreal Transportation Commission which made counts a few days after the change-over, the number of bus passengers had increased by 40% compared with the tram cars.

4. To Build Properly Located Expressways

Our first expressway will be the Metropolitan Boulevard, i.e., the eastern part of it, 17 miles long, between Décarie Boulevard and Repentigny Bridge. Under present conditions, the project should be realized within five years. About the East-West Expressway along the river shore, studies have been pursued up to the point where engineering plans could now be started.

5. To Improve Our Mass Transportation

Should Montreal have a subway system? This is a controversial question for the experts. Before pronouncing on the subject, I think we better wait for the conclusion of the Montreal Transportation Commission report actually in process of preparation.

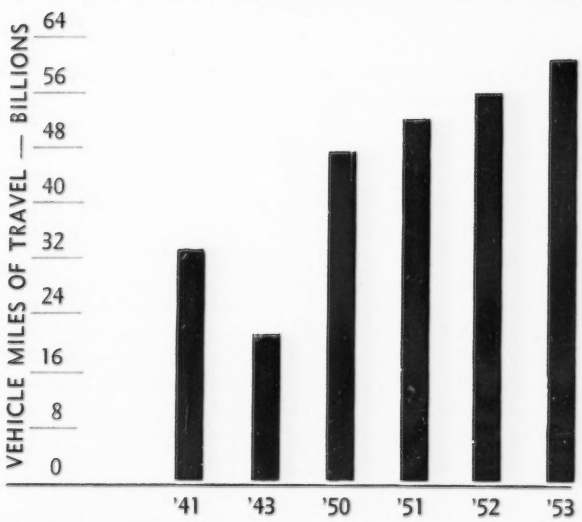
Conclusion

To conclude, I might say that there is one fact which is very clear, and that is, that the Traffic Engineer can make many seemingly minor improvements without excessive burden to the taxpayer, but which would result in real traffic-congestion relief, and which would also help to a great extent in the solution of the overall problem.

Among these simple measures are the continuation of establishing properly located and integrated one-ways for through traffic and the synchronization of signals, especially in view of their progressive timing. The latter will be possible only when the signal timers are modified for this purpose. The necessary funds have been earmarked for this use by the City Authorities.

No doubt that the traffic situation in Montreal should improve in the near future and it will be the duty of the Traffic Engineers of the City Planning Department to complete the studies already undertaken and recommend adequate solutions.

Traffic Trends



TRAVEL ON RURAL ROADS FOR THE FIRST THREE MONTHS OF 1941, 1943, 1950, 1952 and 1953.

Based on Bureau of Public Roads Data

A Traffic Plan for Buffalo

By Charles R. Waters (Mem., ITE)

District Engineer, State of New York Department of Public Works, Buffalo, N. Y.

THE CITY OF BUFFALO is the center of the rapidly growing Niagara Frontier Metropolitan area. It is a waterfront community, with a radial street system planned somewhat after the manner of Washington, D. C. For many years it has suffered from those gradually increasing symptoms of traffic strangulation which are common to all our large centers of urban population. Up to the close of World War II certain makeshift steps had been taken to combat this condition, but limited local finances and lack of coordinated planning prevented a successful attack on the problem. As a result, traffic movement in and around the city was becoming more and more difficult; with the sharp increase in motor vehicle use immediately after the cessation of hostilities, congestion on many vital arteries reached a critical point.

Traffic Studies

The State Arterial Law of 1944, empowered the State of New York to construct arterial routes within cities; previously State highways terminated at city lines. Under this new authority the State entered the Buffalo scene in 1946, and quickly prepared a comprehensive plan of Thruway and arterial route improvements for the city and its surrounding suburbs.

In order to establish a firm basis for intelligent planning, the State conducted extensive studies of population trends, motor vehicle registration and land use throughout the Buffalo Urban Area. In March 1946, a city-wide origin and destination survey of the postcard type was made; within the next few weeks this was followed by a time-flow study. All trends were projected forward to the year 1960.

Findings

The peak hour traffic volumes recorded during the traffic survey were superimposed on maps showing the capacity of principal streets. It then could be clearly seen that the major areas of traffic congestion were on the main radial arteries connecting the downtown areas with the more populous suburbs and along a few important crosstown routes connecting residential and industrial sections.

The population trend studies showed that the greatest growth was in the northern and northeastern suburban areas, and that this trend was likely to continue up to and beyond 1960. Development in the lakeshore section and other southern townships, while active was not as great as in the northern portions of the urban area. The time flow studies indicated a rapid decline in the speed of traffic movement, especially on the already overtaxed radial arteries in the northern and northeastern sectors of the city.

It is interesting to note that population growth and vehicle registration in the Buffalo area has closely followed the trends forecast. During the period 1946 to 1953, traffic volumes and reductions in vehicle operating speeds, while they have in general conformed to the pattern of the forecasts, have outrun the 1946 estimates of future growth. 1952 traffic on the major streets of Buffalo has almost everywhere reached or surpassed the estimated 1960 volumes, while travel time, except where conditions have been alleviated by arterial route improvements, is now close to the estimated 1960 level.

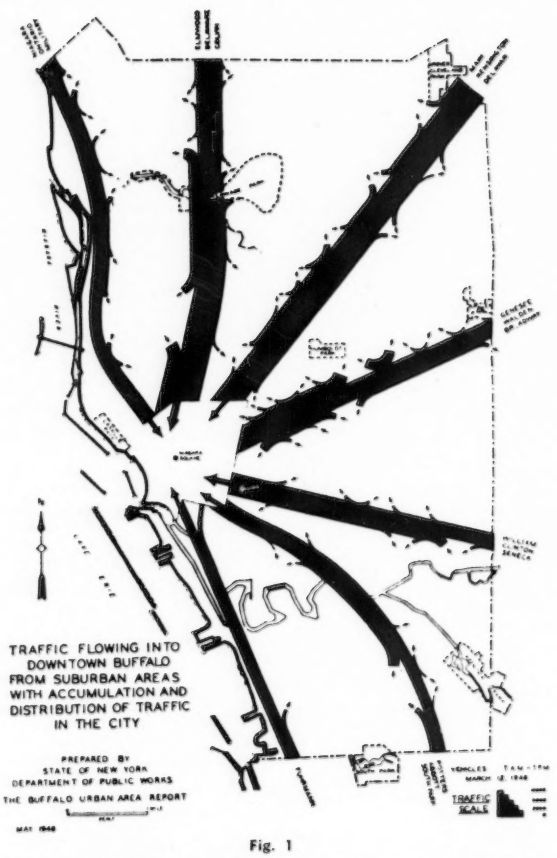

TRAFFIC FLOWING INTO DOWNTOWN BUFFALO FROM SUBURBAN AREAS WITH ACCUMULATION AND DISTRIBUTION OF TRAFFIC IN THE CITY
PREPARED BY STATE OF NEW YORK DEPARTMENT OF PUBLIC WORKS
THE BUFFALO URBAN AREA REPORT
TRAFFIC SCALE

Fig. 1

The accumulation and distribution of suburban and city traffic on the seven bands of major streets results in a gradual increase of volumes toward the center of the city.

The Plan

The various studies here described formed the basis for a comprehensive plan of Thruway and arterial route improvements extending throughout the Buffalo Urban area. It was early decided that the program should be of greater scope than a mere widening and improvement of existing streets; traffic conditions dictated a drastic revision of the arterial route pattern of the city.

In accordance with this line of thought, the Erie and Ontario Sections of the Thruway were routed close to the

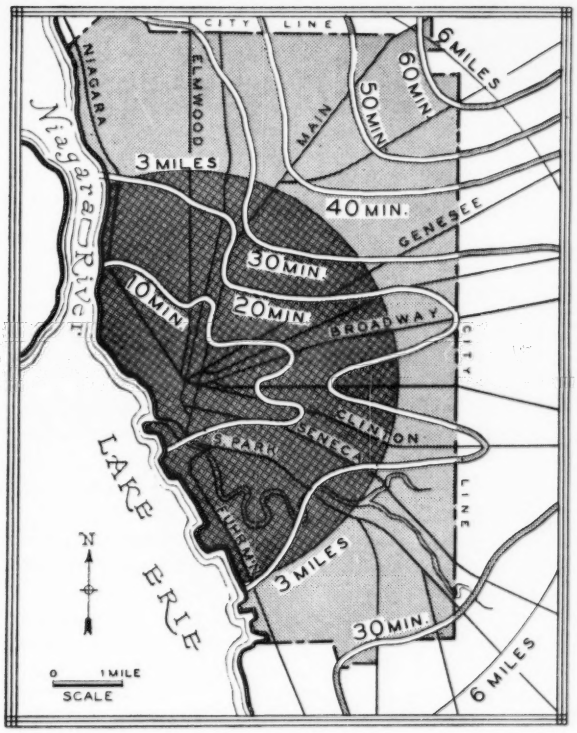


Fig. 2

This plate shows the time required in 1960 to travel from downtown Buffalo to its city line, with no street improvements.

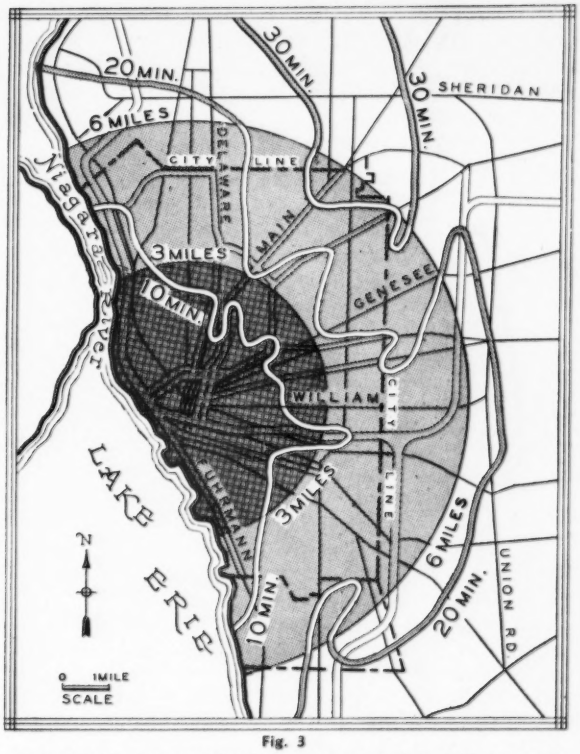


Fig. 3

This plate illustrates graphically the time required in 1960 to travel from downtown Buffalo to its suburbs during the peak traffic hour, with the Thruway and arterial route plan completed.

eastern edge of the city to act not only as a bypass but as a collector of suburban traffic. From a point on the main line of the Thruway directly east of the business center, the Niagara branch was carried through the city to the downtown district, and thence northerly along the waterfront and across Grand Island to the City of Niagara Falls. Thus, this high-capacity expressway, with three traffic lanes in each direction, throughout the urban sections, and with grade separations at every intersection, will serve as the backbone of the city transportation system. With a capacity of 1200 vehicles per lane per hour, it will easily accommodate as many vehicles as a half dozen ordinary city streets.

Supplementing and feeding the Thruway, a complex system of arterial routes, combining widening of existing streets with several semi-expressways was planned. The system consisted of a downtown diffuser surrounding the central business district; various radial routes to accommodate local and suburban traffic and a partial intermediate loop to expedite traffic flow between residential and industrial areas.

The completed plan, together with the studies upon which it was based, was incorporated in an engineering report. This "Buffalo Urban Area Report" was presented to the city and to Erie County in July of 1946 and subsequently approved by the local officials.

A Dynamic Plan

The approved plan was not permitted to gather dust on the shelf, as so often happens. Design and construction of the most urgently needed portions of the plan was immediately undertaken. At the present time, the entire Ontario Section of the Thruway from its junction with the Erie Section northerly and easterly to the Erie County line is either completed or under contract. A one-mile section of the Niagara Thruway in downtown Buffalo has been placed in service. A total of six miles of arterial routes have been

(Continued on page 315)

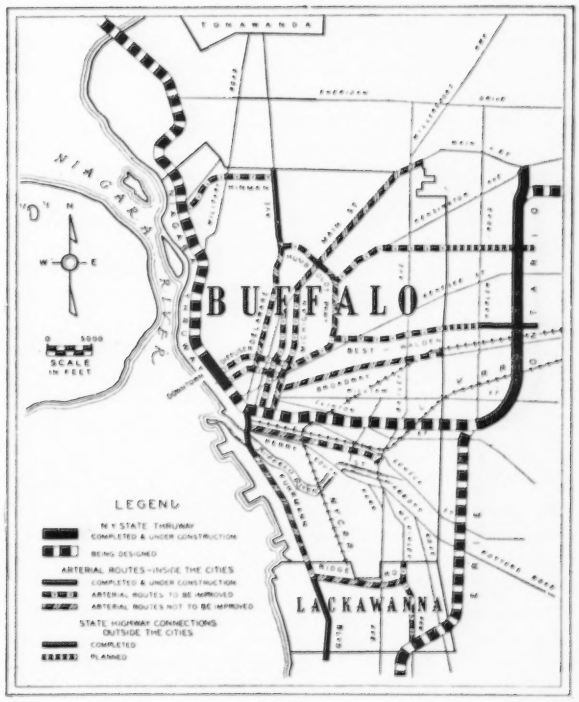


Fig. 4

Plan of Thruway and arterial route improvement in Buffalo.

Some Aspects of Metropolitan Area Transportation Problems*

by Harmer E. Davis

Director, Institute of Transportation and Traffic Engineering,
University of California, Berkeley, California

TODAY, IN ALMOST EVERY COMMUNITY, whether large or small, the congestion of traffic in the streets is a matter of growing concern. The concern is no longer confined to the professionals who specialize on transportation problems. It is being felt by all sorts of citizens, and their demands for relief are driving municipal administrators and city councils to one expedient after another. Many groups are searching for solutions. Business men are groping both in private council and public forum for means of heading off transportation strangulation and its depressing consequences. Men and women who work downtown are seeking ways of getting there, and home again, much faster. More and more, the activities and problems of these and other groups are occupying the attention of the press. And before state legislatures, increasingly insistent demands are being made for special authority and special financing with which to cut the Gordian knot of metropolitan transportation.

Perhaps it is because traffic congestion is so painfully obvious, especially in the central areas of our larger cities, that those standing close to it tend to look for relief in some single counter measure. Proposals for all-out effort on a comprehensive system of express highways, or on a greatly expanded rapid-transit system are examples. Whatever the merits of such proposals in a given case, there is a growing recognition that automotive transportation has been bringing about a large-scale alteration in the general pattern of our urban economy. And there is realization that congestion on our arterial highways and in our business district is but one facet of the urban transportation problem. The current directions of urban development seem to point toward severe economic readjustments. Contemplating this implied trend, we come to the uneasy suspicion that only the most comprehensive treatment can have any important effect. On careful inspection, the problem of supplying transportation services that will guarantee the economic health of our cities appears to be monumental.

There are, however, some bases for optimism. In the first place, the growing interest in the problem is, in itself, an essential preliminary to solution. Public interest leads to public understanding, and public understanding is a prerequisite of public support. We need hardly add that public support is mandatory if any proposal for change in the character of public facilities is to be accepted and acted upon.

Secondly, there are indications that those who have been professionally concerned with the various aspects of urban problems, the administrators, the urban sociologists, the city planning officials, the economists and the engineers, can find common ground and make mutual contributions to transportation planning.

And finally, many of the tools by which to analyze transportation problems have been devised. Over the past half-century highway engineers, faced with the problem of providing the most extensive highway plant in the world, have developed many important techniques for planning highway development. With some modification, these techniques can be applied to the problems of urban transportation planning and operation. Additionally, in recognition of the trends, a number of agencies have been at work for more than two decades, conducting research which is materially improving our understanding of the urban problems.

Two significant characteristics of our present-day industrial civilization are urbanization and extreme fluidity of movement of people and goods. Urbanization, in the sense of physical aggregation of masses of people mutually interdependent upon each other's services, provides the setting for many of our modern problems. And mobility, made possible by flexible, readily available transportation, provides the dynamic linkage which ties together this kind of economy; when mobility is altered, the functioning of the urban economy is affected.

Especially noteworthy in this urban type of economy is the emergence of metropolitan districts or regions. Such metropolitan regions, in part a result of processes of suburbanization and decentralization, actually comprise an aggregation of communities, smaller ones, new or old, clustering about a central city, all closely associated both geographically and economically (but not necessarily politically), so that their needs for certain types of services blend and merge. As pointed out by Hallenbeck[a], the number of metropolitan districts in the United States has increased from 44 in 1910 to 168 in 1950, and by 1950 the population within metropolitan districts was 56 per cent of the total national population. Census figures also show that while the rate of growth of the metropolitan districts has been greater than the average rate of growth for the nation as a whole, for the past four decades the population outside the central cities has been growing at a markedly faster rate than that in the central cities.

The problems connected with the provision of transportation facilities and services in the metropolitan areas, while urban in nature, are greatly intensified and have a number of unique aspects. In addition, in the metropolitan areas, the over-all transportation problem is complicated not only by sheer physical magnitude, but also by administrative, jurisdictional and special financial obstacles. It is to some

*A paper presented at the Syracuse Transportation Conference, Syracuse University, Syracuse, New York, April 29, 1953.

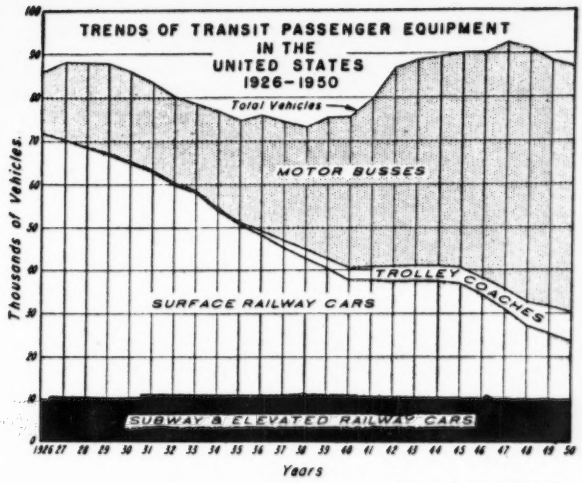


Fig. 1

of the aspects of the metropolitan transportation problem that I wish to address my remarks today.

The transportation situation in which we find ourselves today in our metropolitan areas is compounded from a number of historical ingredients, some of relatively recent vintage. A brief review of these antecedents may be of aid in providing some perspective on the problem.

Some Historical Ingredients

The street or way is, of course, a basic feature in the physical layout of a city, but it would appear that historically the function of a street as a travelled way was merely to provide access, to permit passage—the concept of a street as a means of expediting movement probably developed only gradually. Thus in many of our older cities, unless by chance or occasional foresight some grand thoroughfares had been provided, the facilitation of modern traffic movement can be attained only at great cost through reconstruction.

Before the innovation of mass transportation, the majority of city dwellers made their way on foot. Only the relatively well-to-do enjoyed the luxury of riding in carriages, whether privately owned or for hire.

Urban mass transportation began in the United States in 1831 when the Third Avenue Railway Company of New York City installed the first city streetcar line for the operation of horse-drawn cars. For a moderate cost, many more men and their families then found that they could go about the city faster and with less effort than they could walk. The benefits of this transportation scheme were so obvious that improvements in speed, comfort and scope, followed in fairly rapid succession. Schedules, tandem cars, steam dummies, better track and roadbed and systematization made public transportation on fixed routes a part of the urban picture.

Within a span of less than 50 years after the initiation of transit a revolution in urban transportation was in the making. In 1886 the first electric transit line was tried out in Montgomery, Alabama. Experience in other cities soon proved the commercial success of electric street cars.

Cable cars actually antedated the electric car. The first installation of cable cars was in San Francisco in September, 1873. A number of other cities also installed cable cars later.

Rapid transit was spurred by the construction of the first electric elevated line at the Chicago World's Fair in 1893. New York had earlier introduced an elevated steam locomotive which spit fire and ashes into the streets below. The New York line was electrified soon after Chicago's successful experiment.

The first subway system in the United States was completed in Boston in 1897. Single electrically-operated cars of the regular type were used. London, England, had a subway system with steam locomotives in 1853.

The development of mass transportation and the growth and expansion of cities went hand-in-hand. The electric streetcar carried people three times as fast as they could walk and twice as fast as the horse-car. This increased speed meant that the city dweller had a broader choice of where to live and work. Trolley lines were extended outward from the central areas of cities. Businesses were established along these trolley lines, and people built their homes within the network of lighter routes that fed the main arteries. (Here we may note that "ribbon development" is not a phenomenon invented solely to plague the present-day highway engineer.) The extension of trolley lines into sparsely settled areas brought about new residential communities. Indeed, real estate subdivision booms sometimes were predicated on deals involving extension of transit service.

By 1910 nearly 90 per cent of the people in large cities rode to work and to most other places on electric streetcars. The electric streetcar operation on extended trolley lines made the cities' central business districts easily accessible to increasingly large numbers of people. As a result, central business areas became compact and land values soared.[b, c]

At the turn of the century another revolution was in the making. The advent of the automobile in the late 1890's and early 1900's foreshadowed profound effects upon urban transportation and city development. An efficient automobile industry gradually lowered the price of this new vehicle so that by 1915 it was a familiar sight on city streets. It combined the good qualities of previous vehicles into a private package that many people could buy and operate. Its speed

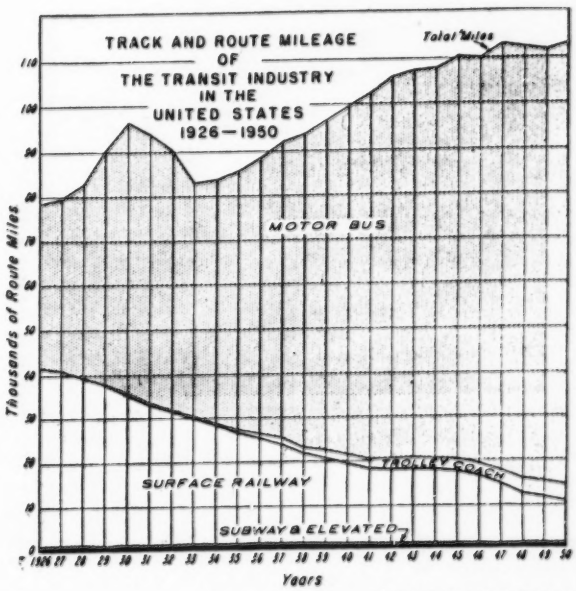


Fig. 2

and convenience began to cause expansion of the outer residential areas and to alter the travel habits of a large segment of the urban population. In 1890, people could live in the suburbs three miles from the heart of the city and get to the business district in 30 to 35 minutes. In 1920 the same trip could be made by automobile in from 10 to 15 minutes.

Not only was trip time shortened by this new vehicle, but it could be parked at the destination, ready to drive away at any time. The private automobile—offering convenience and comfort, the freedom to choose one's time of coming and going and his route, as well as other inherent advantages —began to offer competition to public transit vehicles. Public transportation systems were no longer monopolies. People who could afford to own and operate automobiles could choose between private and public transportation and increasing numbers began to forsake public transportation even for the daily trip to the central city.

Starting in the 1920's, the average citizen began finding a new freedom in transportation—a dependable motor car within his means provided not only a pleasure trip to the country, but began more and more to mean flexible, convenient and rapid personal transportation for commuting and for business. And the rise in the use of the motor vehicle by large numbers of people in the urban areas could only mean a shift in the transportation pattern—a relative long-term decline in mass transit. While prior to 1920 probably something like 90 per cent of the trips into the business districts of large cities was made by transit, the proportion has shifted so that it is presently estimated that, except in the older metropolitan area where rapid transit was already well developed, less than 60 per cent of the daily trips into the business centers are made by transit.

At this point it may be pertinent to interpolate the observation that our city limits are set by time rather than distance. A basic feature in the functioning of the city of the industrial age is the interchange of goods and services on a daily basis. With interchange on this time scale, the speed of transport, in appreciable measure, conditions the functional size of the community. This is strikingly illustrated within the recollection of men now living by the amazing expansion in the dimensions of our metropolitan communities—expansion that has accompanied the changes in modes of transportation: the horse car, the electric streetcar, the elevated railway and subway train, and finally the rubber-tired motor-vehicle.

But the shift to the use of the motor vehicle has been accomplished, as we all know only too well, by mounting congestion on the city streets. It is of interest to note that the public vehicle now has not only to compete with the private vehicle for riders, but also for space in which to operate. More important however, is the fact that traffic congestion, by *decreasing* the speed of movement through the central city, appears now to contribute to a different kind of competitive struggle: the economic competition of satellite business areas with the central business district. This type of competition, curiously enough, now tends to complicate efforts to provide off-street rapid-transit facilities in those metropolitan areas which by virtue of size or congestion or both appear to have need for more than local street transit service. Business interests in the satellite or suburban areas, while expressing general interest in good transportation for residents to and from work, apparently do not always regard with favor a rapid transit system which would make the central business district of the area easily accessible to shoppers as their own locations.

In the foregoing thumbnail sketch I have attempted to provide a setting for further discussion of our problem by highlighting some of the underlying features of urban transportation development. Let us now turn to a brief examination of some of the over-all trends in the transit industry, and in transit riding habits.

Transit Trends and Characteristics

At the beginning of the present century it was generally assumed that the electric railway was the answer to the urban transportation problem. For a period of more than two decades this conviction led to heavy investments in facilities underwritten by long-term indebtedness, and to the assumption by the electric traction companies of franchises with fixed-fare agreements. Over-capitalization and extravagant financing entered as evils in some of the operations.

After World War I, the impact of motor vehicle transportation began to be felt, not only because private automobiles began to play a part in total passenger movement, but also because a more direct form of business competition for the electric railway developed. It first appeared in the form of the "jitney" but it rapidly grew into the bus business.

At first, during the 1920's the street railway companies generally fought the new bus operation, but gradually, usually under financial pressure, the companies began to replace unprofitable streetcar lines with bus routes, and there then followed a period of consolidation in which they tended to acquire the permits of competing bus lines and the control of bus companies. This consolidation proceeded so that, within the last decade and a half, bus operation has become not only an integral part of public transit, but in many smaller, and in some larger cities, transit is entirely a bus operation.

The trend of the last two decades is charted in Fig. 1, which shows the number of transit vehicles of each kind in operation for the successive years from 1926 to 1950. The decrease in the number of street railway cars was halted only temporarily by the conditions during World War II. The increase in the number of motor buses has been continuous, and in some respects, phenomenal. The last two decades has also seen the emergence of the trolley coach as a partial replacement for the street railway car, but the actual number in service is relatively small. It is of interest to note in passing that the total stock of rapid-transit equipment has remained almost unchanged.

A similar story but one with different emphasis is charted in Fig. 2, which shows the track or route mileage for each type of operation. The decline of track mileage compared with the increase in motor-bus route mileage is striking, as is the fact that the total of the route and track mileage, except for the depression years, has shown a long up-trend.

It is of interest to speculate on how much more drastic these trends might have been if the transit companies had not been encumbered with large sunk costs and heavy fixed charges in street railway trackage and equipment and had been free to make extensive replacements with buses or trolley coaches shortly after the acceptance of bus operation as a phase of public transit. The fact that in recent years so many transit companies have converted to preponderantly bus operation is no doubt a recognition that rubber-tired vehicles offer certain operating advantages among which are lower initial investment, possibly lower operating costs per

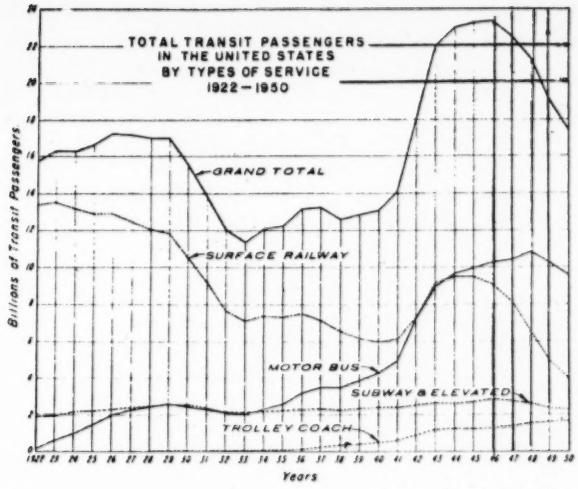


Fig. 3

passenger, flexibility in the use of equipment and in changing of routes, and relief from the expense of maintaining rights-of-way and trackage.

The trend in passengers carried by types of public transit service is charted in Fig. 3. Noteworthy is the fact that the total number of passengers carried during the war years exceeded all previous records, and that even the number carried by the street railways during that period showed a sharp uptrend in spite of a declining equipment and trackage inventory. Since 1946, however, the rate of decline in passengers carried is startling.

If the number of transit rides are reduced to a "per capita" basis, as shown in Fig. 4, some additional observations may be made. Average data for the United States are shown for comparison with San Francisco, Los Angeles and Fresno. It would appear reasonable to suppose that density of population would be an important factor in comparing San Francisco with Los Angeles, while the size of community, type of urban development and the pattern of living, would be a preponderant influence in the comparative riding habits in a community such as Fresno.

So far we have seen an industry whose pattern of operation is in transition, but which is still doing a very appreciable volume of business. Let us next briefly examine the matter of finances. In Table 1 are shown some comparative figures on revenue and costs. Operating revenues have increased appreciably since the end of World War II and for 1950, compared with the average over the pre-war decade, have gone up 52 per cent. On this same basis, however, the operating expenses have risen some 68 per cent, over the previous decade, and these have been greatly influenced by labor costs, which have gone up 80 per cent. Net operating income after taxes, which on the average over the pre-war decade ran about 12 per cent of the operating revenue, has dropped to less than 5 per cent of the operating revenue.

The comparison of net operating income with operating revenue has been given here as a means of pointing up a trend from statistics readily available over a period of years. For the privately operated transit companies, one statistic which receives critical scrutiny is the rate of return on the investment. While the actual figures vary between operations, in general, the transit industry as a whole is faced with a rate of return on its investment so small that, under private ownership, risk capital is not attracted for rehabilitation or reconstruction to meet new conditions. Thus we may note strong moves are being made to shift many operations from private to public ownership.

One factor in the more rapid increase in operation costs relative to revenue, apart from general increase in wage scales and change in value of the dollar, has been the change in pattern of employment in the industry. While formerly the industry handled its morning and evening peak loads by split shifts and part-time employees, these are now practically a thing of the past.

Interwoven with the general financing situation are difficulties which stem from recent trends in our mass living,

TABLE I

TRENDS IN FARES, INCOME AND EXPENSES

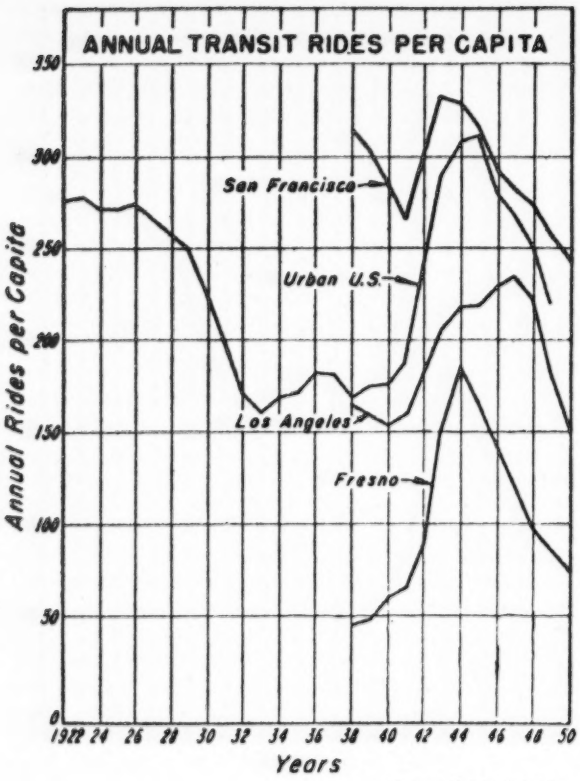
FOR THE TRANSIT INDUSTRY IN THE UNITED STATES

1932 - 1950

Source: American Transit Association

Year	Average Fare[2] Cents	Average Operating Revenue Per Passenger Index	Average Operating Expense Per Passenger Index	Payroll Cost Per Passenger Index	Operating Income, Per Cent of Operating Revenue[3]
1932-1942[1]	6.6	100	100	100	12.11
1943	6.9	104	95	94	13.50
1945	6.9	105	103	101	10.75
1948	8.2	124	141	144	2.94
1950	10.0	152	168	180	4.57

[1] Averages for the years from 1932 to 1942 taken as base for comparison.
[2] Average fares obtained by dividing total passenger revenue by total number of revenue passengers.
[3] Operating income after taxes expressed as a percentage of the total operating revenue.



American Transit Association

Fig. 4

work and travel habits. The five-day week has concentrated the journey to work, and has left a long weekend for recreation and shopping—by automobile. The day of the Saturday trip to market and the ball game, and the Sunday trip to church or the family excursion to a picnic—all by streetcar—are gone. The journey to and from work has been compressed into two sharp two-hour peaks on five week days, requiring what appears to be disproportionate amount of standby transit equipment and labor, and at the same time contributing to the peak-hour congestion on our city streets. Thus we witness a dismal, repetitious, vicious circle of events taking place; more delay of transit vehicles, increased use of automobiles, less business for transit, more private cars, more congestion and delay, and away we go again.

Urban Street and Highway Development

Let us next give consideration to some pertinent features of street and highway development in our metropolitan areas.

An important consequence of the frequent movement of large numbers of people, by whatever means of transportation, from horse to motor car, was improvement of the travelled way. Thus, even before the turn of the century, many cities had miles of all-weather surfaces on their streets; however poor those surfaces may have been by modern standards, they stood in marked contrast to the earth roads of late 19th century rural America.

During the first two decades of this century, the motorist had relatively little difficulty getting around town. The development of our cities was being shaped by the electric railway and nearly everyone rode the "trolley". However, at the same time the paving of city streets was progressing.

So it was that as public interest and pressure developed for good roads, attention was naturally focused on the rural road system; at first, just the primary routes leading to and between the cities, and later the feeders to these routes[4] got attention. Most early effort by the states, and beginning in 1916, for almost three decades, road policy as influenced by the federal-aid highway acts, was largely directed to the improvement of the rural highway systems.

Public policy concerning the adaptation of the urban street and highway systems to the expeditious use of increasing numbers of motor vehicles developed slowly and sporadically. To some degree, the motor vehicle was something to be tolerated and its operations were generally made to fit the limitations imposed by existing street conditions. But gradually, as the impact of the motor vehicle on urban transportation began to be more fully realized, the concept of expediting traffic movement developed.

It is of interest to note that developing congestion on the streets of our larger urban areas was probably a prime factor in forcing action leading to improvement of the street systems. Programs for street widening, for connecting of streets to form through arterial routes became more common. In some of the metropolitan areas urban expressways began to appear. While the practice in several states has varied, a tendency toward the allocation of state-collected highway-user revenue to cities began to be noticeable in the 1930's. This gradual shift in highway policy was reflected in the Federal-Aid Highway Act of 1944, which gave recognition by authorizing expenditures on the "urban extensions" of the federal-aid state highway routes.

It is of interest to note in passing also, that the development of traffic engineering as a specialized branch of highway transportation engineering was probably stimulated largely by the emerging urban transportation problem.

In restrospect one may readily conclude that a significant aspect of the development of the urban street plant has been that, except for the provision of all-weather surfacing, the adaptation of the street systems to expeditious motor vehicle transportation has lagged, and sometimes severely lagged behind the demand for improved facilities. Improvements in the operational characteristics of the existing systems have generally been forced as the result of traffic conditions which at any particular stage came to be judged as intolerable.

Even now, at mid-century, while we find growing recognition of the concept that the function of the major streets or arterials is to expedite[5] the movement of traffic, complete acceptance of this concept still lags; many communities still find it not feasible to remove such obvious impedances to free flow such as indiscriminate curb parking, left-hand turns at frequent intersections, etc. While the urban expressways or parkways have demonstrated a solution to the problem of unimpeded movement, the mileage of such facilities is increasing relatively slowly, owing in part to the fact that costs of construction in the central city areas are exceedingly high, rivaling the costs of subway construction.

But now we find that even though there has been provided some appreciable expansion in the capacity for traffic movement, the situation appears to be growing relatively worse: improved facilities have invited greater motor-vehicle

[4] In some of the very early rural good-roads campaigns the railroads also took part, since it was believed that improved feeder roads to the railheads would augment rail traffic.

[5] Interestingly enough, the view has also developed that the local service streets should, in the interest of safety, be intentionally designed to eliminate the movement of through traffic and to discourage the rapid movement of all traffic.

use. Congestion on the downtown streets has not been lessened, and even the expressways tend to flow full shortly after they are placed in service. And, in addition, the terminal problem—parking—has emerged as a critical limitation to the influx of vehicles into the business areas.

Thus, while the motor vehicle has contributed to a new standard of living, and a pattern of urban development which has many desirable features, the problems of urban transportation have multiplied, intensified and have become more complicated.

Scope of the Urban Transportation Problem

Let us now turn to an attempt to define somewhat more closely the urban transportation problem, as it exists today and as it may provide a possible basis for an approach to future development.

The provision of transportation service has a number of aspects as follows:

(a) Transport movements comprise both the conveyance of persons *and* of goods. Because large proportion of the movement takes place through the city street system, these two transport functions cannot be considered separately.

(b) The movement of persons involves the simultaneous use of: privately-owned and operated automobiles; for-hire vehicles such as taxi-cabs and limousines; local transit[6] vehicles such as buses, trolley coaches, street cars; rapid-transit[6] vehicles such as cars, trains or buses on surface, subway and elevated rights-of-way; and, conceivably, air and water-borne conveyances. Additionally, movable platforms may come into use. As has been previously intimated, the use of the various conveyances is competitive and many of the operational features are closely interrelated.

(c) Suburban and intercity transport facilities by rail, water and air may have an important effect on the intra-city transport services, especially in the metropolitan area.

(d) Terminal facilities are as much a part of a transportation system as the travelled way. Terminal facilities in a metropolitan area may include on- or off-street parking for automobiles, on- or off-street loading zones or docks for trucks, and truck, bus, rail, ship and air terminals.

The crux of the problem appears to be a better coordinated operation of these various transport services to the end that the effort in providing them shall not be a wasteful drain upon the resources of the community and that suitable standards of living and levels of economic activity shall be maintained. Coordinated operation does not mean management by a single agency. Rather it means that on the basis of factual appraisal, through the formulation of informed public policy, by the planning, construction and operation of such facilities that the public agencies may have responsibilities for, stimulation is given to the balanced use and development of the entire system of transport.

Lack of coordinated management on the part of municipal government alone is illustrated by a listing of some of the functions of departments of a hypothetical city. The rough picture is something like this: The Planning Commission has a plan; it probably has the desired land use blocked out, together with a general circulation scheme based mainly on a current or proposed arterial street system; the Planning Commission admits its function is purely advisory. The Public Utilities Commission or the equivalent thereof runs the transit system or keeps its eye on a private corporation which runs it; in either case, it's a losing fight insofar as straight operations are concerned; the main idea is to keep from going too far in the red, so any system expansions just don't seem feasible. The Street Department takes care of the cleaning and makes what repairs it can under the budget given to it. The Electrical Department looks after street lighting and may have to service the traffic signals. The City Engineer at least has to keep his eye on plans and specifications for new construction, but the money comes in by annual driblets, and besides he has to look after bridges, sewers, water supply and buildings in general. The Traffic Engineer tries to figure out if a pair of one-way streets will squeeze a few more cars through per hour, but he can't be quite sure because in his particular town the Traffic Police set the signals as well as look after parking violations. The new Parking Authority ought to be some help, but the demand is great and the future trends are unknown, and besides, the Council is suspicious. Then there are a considerable number of special permits, franchises, and licenses affecting transportation in one way or another, but by the accident of history the control of these has been scattered through a half-dozen different departments of city and state government, so it's better to let sleeping dogs die. All things considered, it all works somehow some of the time, so the Mayor and the Council stand by for troubles and go after them as they arise.

Issues of Public Policy

In view of the trends in transportation development, such as those which I have sketched, and in view of the immensity of the picture, which I am sure no one of us completely grasps, it is not surprising that there are many unsettled questions which are becoming issues of public policy. I can mention only a few of them here.

One question relates to what steps, if any, should be taken to prevent deterioration of, and hence loss of invested capital in, the downtown business districts[7]. This question assumes that the economic activity in, or value of, the central business district is declining or will decline. Some critics of the view implied by this question point out that except for some cities, the central business may merely be reaching a plateau of activity and that there is a kind of saturation level for such activity, regardless of the potential numbers of persons who may have ready access to the district. Downtown business men, however, who fear the possible decline in business activity, are advocating either new or improved rapid transit, or a larger supply of off-street parking facilities. On the other hand, some observers, while recognizing decline of the central business district as a real possibility or something already on the way, look upon it as a natural and inevitable shift; they point out that the compact central core characterized by very high land values was a product of mass transit as the sole mode of transportation, but that flexible, free-flowing automotive transportation is producing a characteristically decentralized type of city.

The matter of mass transit is a question by itself. The general financial situation to which we have previously alluded points up the key issues many cities must face now or in the near future; public ownership, and subsidization of transit operations, whether publicly or privately owned.

[6] Transit is defined as the passenger-carrying service available to the public at stipulated fares, generally by large capacity vehicles operating on regular schedules along fixed routes.

[7] A most interesting discussion on this question is summarized in the February 1953 issue of *Architectural Forum*, under the title of "Urban Traffic Forum; 13 answers to how big cities can save their downtown districts from strangling in their own congestion".

Various plans have been offered as interim solutions. One, for example, which has attracted attention recently is the Bingham proposal[4]. Under this plan, a municipality afflicted with financial "transititis" would buy privately-owned transit properties with the proceeds of a revenue bond issue secured by income from fares. The system would be operated by a private management, presumably the company that had just sold the properties. The virtue claimed for this plan is that the operation would no longer be burdened by taxes. It is thus implied that the sums now paid in taxes by the privately-owned transit companies are what make the difference between a fair profit and a loss on an operation. Opponents of this proposal have been quick to cry that a subsidy by any other name is still a subsidy. If transit is to remain a completely privately operated service, should recognition be given, through easement of regulation, restrictions and controls, to the fact that public transit is no longer a monopoly but is highly competitive? Will easement of regulation, in fact, lead to more efficient operation by possible more-ready adaptation to changing conditions? And should encouragement be given to transit riding by reducing delay through measures such as prohibition of curb parking on business streets, and regulation of free schedules for off-street parking so as to discourage all-day parking and hence converting "preference drivers" of automobiles to "preference riders" of transit vehicles?

Another type of question has to do with what is called "urban sprawl". This term refers to the rapid indiscriminate, uncoordinated, uncontrolled growth of the suburban fringe areas in a metropolitan district. Such growth has been observed in many cases to give rise to improper land use or to conflicts because of inappropriate association of residential, industrial and local shopping or business areas. Such development is made possible because of flexible, personal transportation. The problem is how to insure a more orderly and stable development of the outlying areas, and how the local highway system can be planned to aid in an orderly development. A subsidiary problem, but one which can remain to haunt us in the future, is the matter of standards to which the street systems should be built in the newly developing subdivisions.

What Approach?

Many students of the problem, and increasing numbers of responsible officials believe that further attack on the urban transportation difficulties especially those in the metropolitan areas, requires comprehensive and integrated treatment, and consideration of the forms of transportation as complementary. Obviously such an approach would require integrated planning of facilities and operations. I doubt if there now exists, in local government, a responsible agency for the general analysis of and planning for transportation services, transit, street development and operation and terminal facilities.

Such planning in turn, to be defensible and realistic, would require a backlog of factual information and factual appraisal. The appraisal of the urban transportation problem is no simple task; the planning and design of optimal transportation systems will require the employment of a wide range of technical knowledge and methods, and the use of a great variety of factual data concerning the developed areas.

The urban areas have not been as fortunate as the states with respect to accumulating the statistical information with which to plan. Major improvements in physical layout or plant in the cities took place gradually, and further, insofar as the total transportation services have been concerned, the management has been dispersed and largely uncoordinated. The necessity for the routine collection of basic information was not apparent in most of our urban areas; until recently, no apparent urgency existed. Thus we are now faced with a situation in which adequate basic data simply do not exist for the comprehensive appraisal of urban transportation.

Coordinate with planning and appraisal of transportation is the need for devising an acceptable and effective scheme of management or administration. To obtain proper scope, the metropolitan transportation district idea may be worthy of consideration and development. The functions of such a district agency would not necessarily be those of operating rolling stock, but they would certainly include planning, programming and improvements, supervision of design, construction and maintenance of fixed facilities.

And finally, earnest and imaginative consideration will have to be given to new problems in financing, both with respect to sources of funds and to allocations.

Concluding Remarks

In this paper I have attempted to sketch the significant features in the development of transit and of automotive transportation, and to indicate their complementary and competing aspects, as well as their interrelationships to the character of development of our cities, and in particular the metropolitan areas. I have implied that dynamic changes are taking place and that perspective is necessary to estimate the probable interrelated effects of quality and type of transportation services upon further changes in the urban pattern.

Some issues of public policy have been mentioned to point up the fact that decisions must be made, either to do nothing or to take some positive steps toward steering development toward desirable objectives. Needless to say, in turn, a decision would be necessary concerning desirable objectives.

A clear delineation of objectives in urban development, and of courses of action (or of policy) which can achieve them, requires some notion of the part that various influences, such as transportation, play in producing change. Obviously our metropolitan areas are not going to be made or remade over night; this further accentuates the need for policies which lead to adjustments on a long-term basis and for a sufficient public understanding of the nature of the problems to support such policies.

A conclusion that may readily be drawn from an examination of the characteristics of transportation in our metropolitan areas is that all forms of urban transportation and many of their features, such as terminal facilities, are interrelated. Stop-gap measures with respect to one form or phase cannot help but affect the whole transportation picture, and in our present state of knowledge, the long-range effect of many measures designed to stimulate or control transport service is unpredictable.

I share the view of many students of transportation, that an appraisal of the whole urban transportation is overdue and is highly necessary. Many of the statistics necessary for a real appraisal are missing, and probably a number of techniques of analysis will have to be devised before appraisals can be made which are sufficiently complete to form a defensible basis for recommended policy.

The current and growing interest in metropolitan-area transportation difficulties is a first and important step toward an understanding of the problem. It is a prelude to what I hope will be transportation policy that can support the

(Continued on page 315)

Open Discussion

By Charles Adler, Jr. (Affil. Mem., ITE)
Consulting Engineer, Baltimore, Maryland

Speed Space System For Safer Highways

THE RAILROADS are the safest form of transportation. They operate their trains at high speed, regardless of traffic density. And they do it safely, by means of the block system.

The Air Navigation Board of the Civil Aeronautics Administration now is advocating a similar block system for air traffic. And yet, the automobile, the most dangerous form of transportation, still moves helter-skelter at high speed along our highways.

Why not correct this situation? Why not protect each motor vehicle with a block system? It could be done in a simple and inexpensive manner—merely by painting across the right lane of the highway, transverse lines spaced braking distance apart for the particular speed zone in which they are located. These lines could be painted a different color for the speed zone in which they are situated; for instance, the block-lines in a 70 mile-an-hour zone would be painted red, the lines in a 50 mile-an-hour zone might be painted yellow, and those in a 30 m.p.h. area could be green. This would be a constant reminder to the motorist of the speed zone he is traversing.

Let us see how such a system would work out in practice: A motorist enters a high speed toll road and stops at the turnpike-booth. He pays his toll and is advised that the road ahead is divided into blocks or sections marked by colored lines, and that one car only is permitted in a section. If he encounters a car ahead he must remain two lines behind it unless its speed is so low that he intends to pass it.

The motorist proceeds down the highway and encounters a sign: "Speed Limit 70, Keep Two Lines Behind Car Ahead Except When Passing." As he crosses the first red line he notes that there is no car ahead between the first line and the next red line, which he can see in the distance augmented by an upright red marker at the side of the road. His block is clear.

As the driver continues his journey, he notices a car ahead in the distance. Although our motorist's speed is within the proper limit, he appears to be gaining on the other car. He is now two space-lines behind the other car, as close as he can legally get. Our driver has the choice of either continuing behind the car ahead at the safe space of one block (which is predetermined braking distance in length for the speed zone) or, if the passing lane is clear, of pulling to the left and passing. But suddenly the driver of the car ahead slams on his brakes and makes a sudden stop for some reason or other. Our driver has ample space to decelerate and pull out and pass the car, or to stop safely behind it if the passing lane is not clear. Thus, what might have been a dangerous rear-end collision with chain reaction involving other cars following behind, is safely avoided.

Of course, the distance between the block-lines will vary with the speed zone in which they are located. As the speed limit decreases at the approach to curves, cross-roads, towns, tunnels, etc., the lines will get closer together, until below 20 miles-an-hour they can be discontinued, as the cars are proceeding at a sufficient low rate of speed to follow each other in close formation.

As mentioned above, the block-lines and upright markers can be painted a color different for each speed zone to clarify their meaning and to keep the motorist alert. They will also serve as a concise check of motorist behavior to enforcement officers.

SOME ASPECTS OF METROPOLITAN AREA TRANSPORTATION PROBLEMS

(Continued from page 314)

healthy progress of this urban form of living to which we seem to be committed.

Acknowledgement

I wish gratefully to acknowledge the ever generous assistance of my associates in the Institute of Transportation and Traffic Engineering, especially in this case Messrs. Norman Kennedy and Howard Lapin, in the collection and analysis of information on the basis of which these thoughts have evolved. I wish to acknowledge also the generosity of many highway and traffic engineers, and transit officials in making available to us information and thoughts on the nature of the problem.

REFERENCES

a. Hallenbeck, Wilbur C., American Urban Communities, Harper, N. Y., 1951. Chapter 13.
b. Park, Robert E., "The Urban Community as a Special Pattern and a Moral Order", in *The Urban Community*, ed. by E. W. Burgess, University of Chicago Press, Chicago, 1926, p. 6.
c. Hoyt, Homer, "The Influence of Highways and Transportation on the Structure and Growth of Cities and Urban Land Values", in *Highways* in Our National Life, ed. by J. Labatut and W. J. Love, Princeton University Press, Princeton, 1950, p. 201.
d. Bingham, S. H., "The Bingham Formula," Mass Transportation, Vol. 47, August 1951, pp. 21-24.

A TRAFFIC PLAN FOR BUFFALO

(Continued from page 307)

completed or are under construction, including the $10 million high level bridges over the Buffalo River.

Progress of construction is, of course, controlled by availability of funds and by difficulties encountered in property acquisition. Traffic flow in the city has been benefited to a marked degree by the projects completed and opened to traffic. When completed, the plan will provide Buffalo with a highway transportation system second to none in the nation, a system absolutely essential to the continued growth and development of the nationally vital industrial and commercial complex of the Niagara Frontier.

PLEASE MENTION

TRAFFIC ENGINEERING

When Writing to Advertisers

By Douglas J. Carmody (Jun. Mem., ITE)
Alameda County Traffic Engineer
Oakland, California

Improved Delineation of Sharp Curves

ON A SHARP CURVE, there is need for delineation to aid drivers traveling around the inside as well as those on the outside of the curve. On large radius curves, the centerline stripe is usually all that is needed to show the driver on the inside of the curve the path he should take. The delineation is then placed to aid the driver on the outside of the curve. However, on sharp curves the driver on the inside of the curve may lose sight of the centerline as he approaches the curve, especially at night.

We have developed a method to eliminate the problem on all curves. The method involves the use of existing materials, so positioned, that curves "light up" to drivers on the inside as well as those on the outside of curves. The method essentially involves the placing of two pieces of reflective sheating ("Wide Angle Scotchlite" or others) mounted on aluminum on a post so that each piece is perdendicular to a direction of approaching traffic. Figures 1, 2, and 3 show how, by the use of 4″ x 6″ and 6″ x 8″ pieces of reflective sheeting, this heretofore impossible task has been accomplished. The posts are 3″ x 8″ placed with the wide side facing traffic approaching on the outside of the curve. On the wide side of the post facing the traffic on the outside of the curve, the 4″ x 6″ piece of sheeting is attached by galvanized nails. On the reverse side of the post the 4″ x 8″ piece of sheeting is placed so that a 4″ x 6″ portion is nailed to the post with the remaining portion, 4″ x 6″, bent so that it is perpendicular to approaching traffic when that traffic is about 200 feet in advance of the post. This bending can be done quite simply by hand, and because of the wide angle characteristics of light incidence and reflection, great accuracy in alignment is not essential.

The spacing of delineators as recommended in the "Manual of Uniform Traffic Control Devices" published by the Public Roads Administration and available from the Superintendent of Documents of the U. S. Government Printing Office, has been used and found satisfactory.

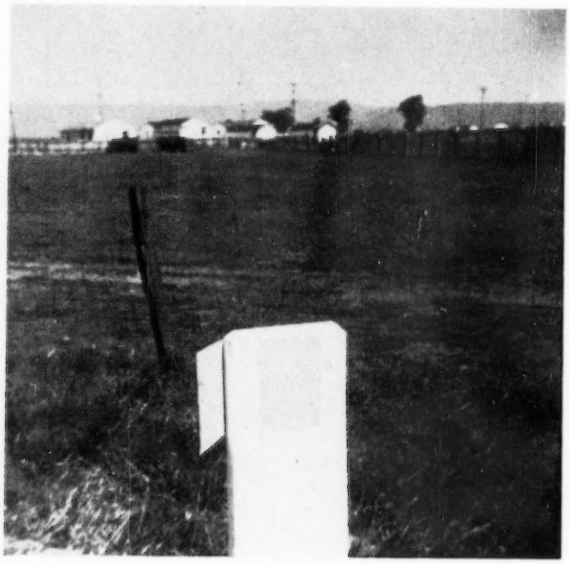


Fig. 2

Fig. 1

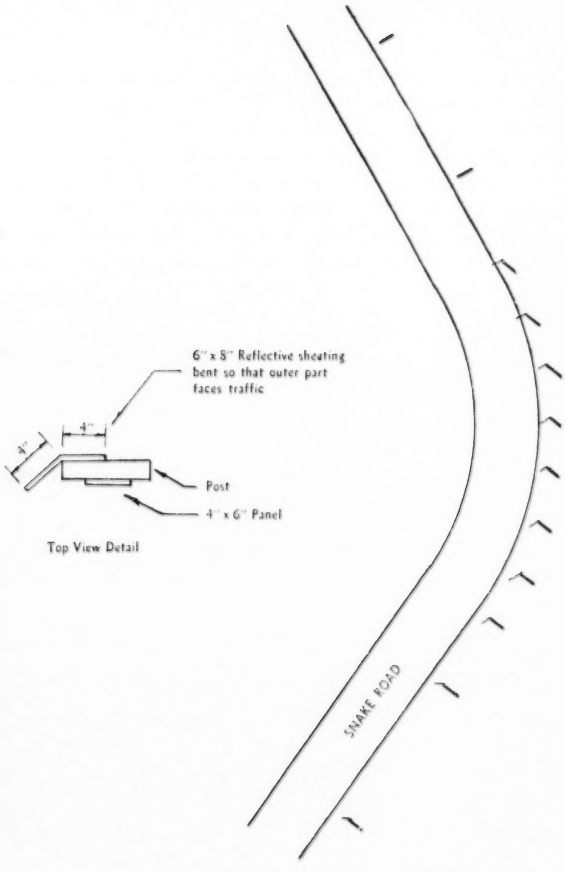


Fig. 3

TRAFFIC NEWS

National Awards Announced by ITE

F. Bruce Crandall, President of the Institute of Traffic Engineers, announced on June 4th that ten states and eighteen cities in the United States are being honored by the Institute for outstanding performance in traffic engineering during the year 1952.

The seven winning states and ten cities which were selected by the Institute's Committee as deserving national recognition will be awarded plaques. The awards are based on outstanding traffic engineering achievement, including traffic control devices, surveys of traffic problems, street lighting, intersection design, traffic administration and highway planning.

In announcing the award winners, Mr. Crandall said, "Again the value of continuing sound engineering programs has been proven by those states and cities receiving awards for outstanding achievement in 1952. In the face of rising traffic and construction insufficient to meet essential needs these states and cities were able to hold the line on the frequency of accidents, even in some cases to reduce the rates. Such accomplishments are noteworthy because they become the more difficult each passing year."

Forty-eight states and 757 cities participated in the contest. The awards were decided on information submitted in the Traffic Engineering Section of the Annual Inventory of Traffic Safety Activities.

The awards by *states* were decided in four regional groups and a fifth group including the eight most thickly populated and heavily trafficked states. The awards are as follows:

GROUP I—Eastern Region—A duplicate First Place to *Connecticut* and *New Jersey*.

GROUP II — Southern Region — First Place, *Virginia* (4th consecutive year); Second Place, *Florida*.

GROUP III — Midwest Region — First Place, *Minnesota* (5th consecutive year); Second Place, *Oklahoma*.

GROUP IV — Western Region — First Place, *Washington* (3rd consecutive year); Second Place, *Oregon*.

GROUP V — Heavily Populated and Trafficked States — A duplicate First Place, *California* (3rd consecutive year) and *Michigan* (2nd consecutive year).

The winning cities and second places are:

GROUP I—For population of 1,000,000 and over, a duplicate First Place, *Detroit*, Michigan; and *Los Angeles*, California (last year's winner).

GROUP II—For population of 750,000 to 1,000,000—First Place, *Washington*, D. C.; Second Place, *Cleveland*, Ohio.

GROUP III—For population of 500,000 to 750,000—First Place, *Milwaukee*, Wisconsin (last year's winner); Second Place, a tie between *Buffalo*, New York, *Cleveland*, Ohio, and *Pittsburgh*, Pennsylvania.

GROUP IV—For population of 350,000 to 500,000—First Place, *Kansas City*, Missouri (last year's winner; Second Place, *Denver*, Colorado.

GROUP V—For population of 200,000 to 350,000—First Place, *Providence*, Rhode Island (last year's winner; Second Place, *Norfolk*, Virginia.

GROUP VI—For population of 100,000 to 200,000—First Place, *Charlotte*, North Carolina; Second Place, *Arlington*, Virginia.

GROUP VII—For population of 50,000 to 100,000—First Place, *Evanston*, Illinois (last year's winner); Second Place, *Lubbock*, Texas.

GROUP VIII—For population of 25,000 to 50,000 — First Place, *Miami Beach*, Florida (last year's winner); Second Place, *Ann Arbor*, Michigan.

GROUP IX—For population of 10,000 to 25,000—First Place, *Wilmette*, Illinois; Second Place, *Grosse Pointe Park*, Michigan.

The Institute of Traffic Engineers directs the assembly of traffic engineering accomplishments submitted in the Annual Inventory of Traffic Safety Activities upon which the awards are based. The Committee of prominent Institute members which judged the achievements consisted of Chairman Maxwell Halsey, Executive Secretary, Michigan Safety Commission, Lansing; Charles A. Goodwin, Traffic & Transportation Engineer, Liberty Mutual Insurance Co., Boston; Gordon K. Gravelle, Transportation Engineer, Automotive Safety Foundation, Washington; Edward R. Klamm, Accident Prevention Manager, Allstate Insurance Company, Chicago; and Charles W. Prisk, Supervising Transport Research Engineer, Bureau of Public Roads, Washington, who is also Secretary-Treasurer of the Institute of Traffic Engineers. Institute Vice-President Harry Porter, Jr., Traffic Engineer, National Safety Council, served as secretary to the Judges Committee.

Traffic Conference to Be Held at Purdue in June

A conference on Road and Street Traffic Control will be held at Purdue University, West Lafayette, Indiana, June 22-24, 1953. This conference, sponsored by Purdue University in cooperation with the Indiana Section, Institute of Traffic Engineers, will provide information on basic traffic control methods and techniques for city and county administrators, engineers, and enforcement officials concerned with local traffic problems. Other interested persons may also attend.

Efficient use of traffic signals, signs, marking and channelization devices, and curb parking facilities, as well as state and local traffic control relations will be discussed. Speakers include K. B. Johns of the Kentucky Department of Highways; W. C. Milner and George L. Reyman of the Indiana State Highway Department; J. L. Lingo, Indiana Director of Traffic Safety; John H. Bunch and Paul Rice, Traffic Engineers of Fort Wayne and Evansville, Indiana, respectively; Floyd Kline of the Anderson, Indiana, Police Department; and Professor R. B. Wiley, S. W. Gallien, and H. L. Michael of Purdue.

The conference, under the direction of John E. Baerwald, Research Engineer, Joint Highway Research Project, Purdue, will also include a smoker featuring manufacturers' displays of traffic control devices and a banquet.

Registration and program information may be obtained from Mr. Baerwald.

More Engineers Needed

By 1954 there will be 30,000 new engineering jobs in civilian industry alone and only 12,400 new graduates to fill them, the American Peoples Encyclopedia 1953 Yearbook reports.

Because of the serious shortage of engineers in America, most engineering students are being grabbed up before the ink on their sheepskins is dry, asserts the Yearbook article on "Engineering."

One major reason for the shortage is the large number of engineering graduates being inducted into the armed services. The survey of supply of engineers conducted by the Engineers Joint Council, New York, revealed that of 29,420 who in the past year received engineering degrees, 6,100 were commissioned in the armed forces as a result of ROTC training.

Another 1,363 were enlisted members of the Armed Forces reserve or National Guard, and 6,473 became eligible for draft upon graduation. Of the remaining graduates, 1,836 indicated they were planning to continue full-time graduate studies.

One suggested solution to the critical shortage is for the industry to make more efficient use of the engineers it does have, instead of wasting their skills on routine jobs.

"In a survey conducted by the National Society of Professional Engineers, one large eastern utility company revealed that only 45 per cent of its available engineering man-hours were actually being spent in engineering work," says the American Peoples article.

"Only 70 per cent of the engineers were doing technical engineering work, and even they devoted a third of their time to routine non-engineering jobs. Most of the engineers on non-engineering jobs were admittedly qualified and available for engineering tasks."

There is one slightly optimistic note, however. The U. S. Office of Education recently reported that enrollments in engineering schools, which had been steadily declining, showed an upturn in 1952, with 16.2 per cent more freshmen than in 1951. This increase was attributed to an intensive campaign to attract more students to engineering.

Highway Officials Testify Before House Roads Subcommittee

Charles M. Ziegler of Michigan, President of the American Association of State Highway Officials, Messrs. B. D. Tallamy of New York, A. E. Johnson of Arkansas, R. A. Harris of Mississippi, R. H. Baldock of Oregon, and D. C. Greer of Texas, Members of AASHO's Executive Committee, testified during recent hearings before the Roads Subcommittee of the House Public Works Committee.

Mr. Ziegler and other AASHO representatives told the House Subcommittee that, "Early in 1952 our Association filed with your Committee during hearings on the Federal Aid Highway Act for 1952 an estimate of need on our Federal-Aid system. This was the amount of money we estimated would be required to bring the approximately 664,000 miles of the then approved Federal-Aid system up to the standards required by today's traffic as of January 1, 1952. It shows that out of 664,000 miles which carry better than 80 per cent of all of our rural vehicle traffic, 64 per cent is deficient by today's standards, and that we should expend, as of that date, to bring it up to the standards required to meet today's traffic, the total of approximately $32,000,000,000."

The AASHO President went on to say that the Association is thinking in terms of a 15-year program, with a total annual capital outlay for the Federal-Aid system of about $3,500,000,000.

Seek Federal-Aid Equal to Federal Gasoline Tax Total

President Ziegler and other AASHO spokesmen pointed out that the Association has gone on record several times in the past suggesting that the Federal Government retire from the field of taxation on motor fuel and to leave this field to the states, since it has been historically their chief source of revenue to build and maintain highways and streets.

The witnesses went on to say that since the Congress has decided to continue the tax it should increase Federal-aid for highways to an amount not less than the Federal receipts from the Federal gasoline tax.

They praised the work of the Bureau of Public Roads, particularly as a strong influence in bringing about uniformity of practice in highway design and construction throughout the nation. The testimony went on, "It is equally important in view of the unprecedented increases in traffic and rapid development of improved types of motor vehicles, that these national systems of highways be expanded and redeveloped on a generally uniform basis throughout the nation through the coordination which the Bureau of Public Roads now furnishes and should continue to furnish."

In reply to other questions on a Roads Subcommittee questionnaire the AASHO representatives stated that it is impossible to say categorically whether or not an urban area by-pass is beneficial to a locality, that it is a question of local traffic desires and each proposal should be considered upon the facts and conditions involved.

Ask $210 Million for Interstate System, Based on Population

Association spokesmen repeated a previous AASHO request that $210 million be set aside for the Interstate System of Highways, and that this amount be divided among the states on the basis of population, guaranteeing a minimum of ¾ of 1% of the funds so recommended to any state regardless of population. They pointed out that some 35,000 miles of the Interstate System has yet to be improved to tolerable standards.

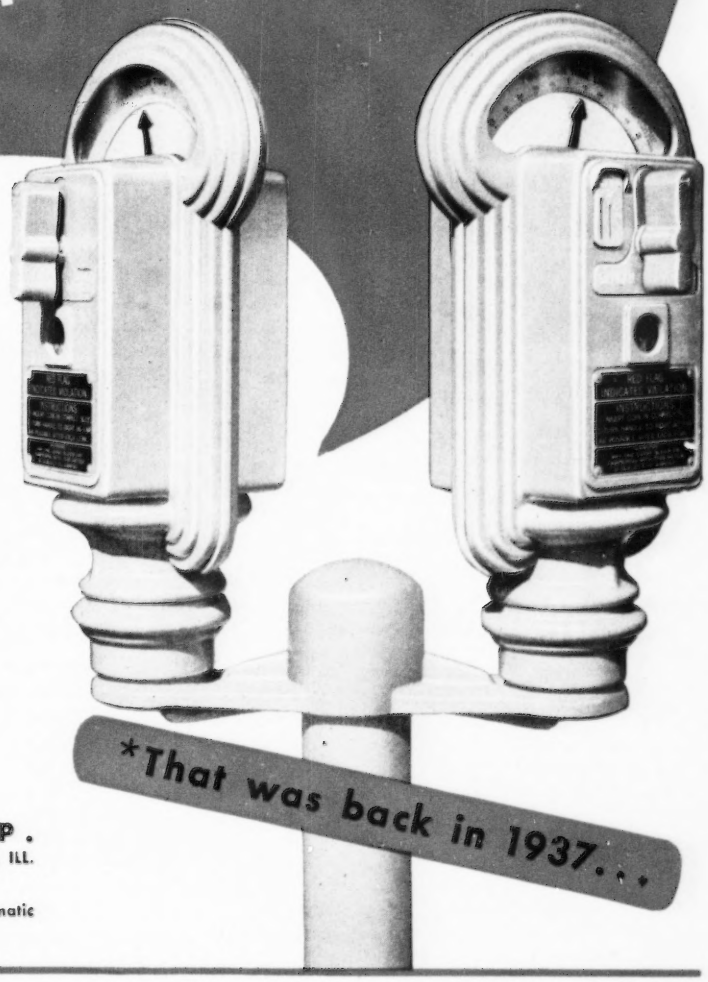
In other testimony AASHO representatives went on record as against Federal participation in maintenance and repair costs, and stated that the Association has not yet formulated a policy on toll roads.

On the question of vehicle size and weight AASHO spokesmen said, "Many answers are needed as to what constitutes adequate geometric and structural highway design. Also, what is the proportional share of financing the highway plant that should be borne by the various classes of users, and what constitutes an optimum and the most efficient balance between highway use and motor transportation? To answer these questions, factual research involving physical tests and comparison economic studies are a requisite and a necessity. The results of such research must be awaited before the effect of heavy traffic on highway specifications and construction costs can be properly evaluated."

Roads Subcommittee Chairman J. Harry McGregor (R., Ohio) asked each AASHO witness whether or not they believe we are losing ground in national highway improvement. The consensus was that ground is being lost at a rate of about $3 billion per year.

Half-a-Million Meters Ago*

...we installed the original multi-coin DUNCAN-MILLER PARKING LOT METER



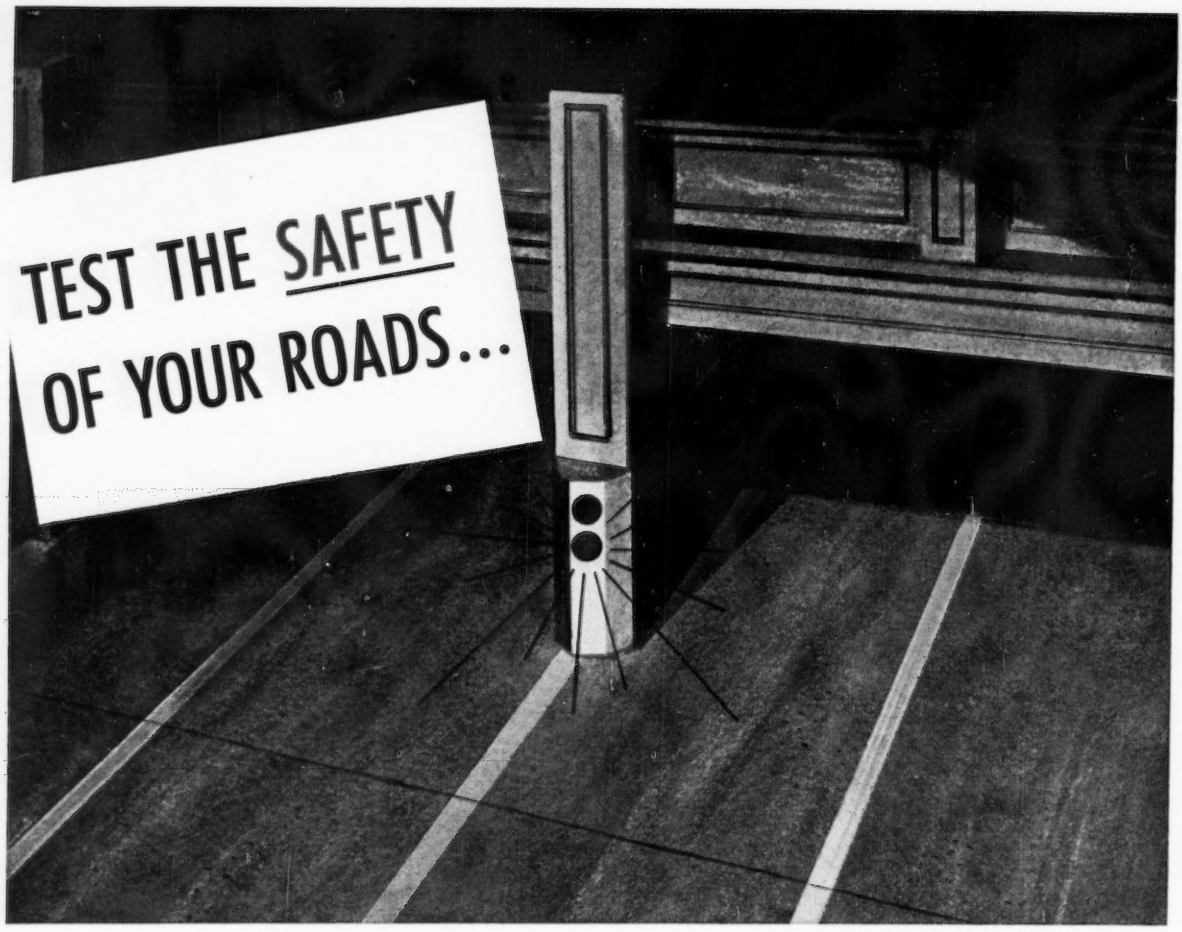
YES, IT WAS back in the Spring of 1937. Atlantic City needed long-time meters for beach parking. Even way back then, Duncan-MILLER meters gave time for a nickel and a quarter.

● Since then we've made enormous improvements and stepped-up their efficiency. For instance, they now have wipe-off time, and operate with a dime as well as a nickel and quarter. We've installed tens of thousands of them in scores of parking lots among the 1001 cities now metered with Duncan-MILLER manuals (and our sensational 100% automatic Duncan-AUTOMATON).

● In reality we're "half-a-million meters old". It's this vast know-how that has made Duncan-MILLER street and parking lot meters so versatile, so dependable, such high revenue producers, and so most-often bought. Is it any wonder we're the world's largest manufacturer of parking meters—manual and automatic. For free consulting service on curb or off-street metering, write us today.

DUNCAN
PARKING METER CORP.
835 N. WOOD ST. CHICAGO 22, ILL.
Factory at Harrison, Arkansas

Manufacturers of the DUNCAN-AUTOMATON fully automatic and the DUNCAN-MILLER manual parking meters.



Can hazards be seen in time?

Here's a marker that can be seen sooner—giving the driver those precious extra seconds that often avoid accidents. Test it for yourself some night. Set up a Stimsonite marker next to any other reflector of equal area. Go back a half mile. Then drive toward them—fast. You'll see the Stimsonite warning first, every time. You'll be able to react in time. Try it.

You'll be proving the superiority of an entirely different reflector design. Visibility (target value) always depends on the amount of light which is reflected back *toward* the driver. Coated, curved and irregular reflecting surfaces scatter the light. Stimsonite concentrates the headlight beam directly back toward its source.

Here's how. Three mirrors, forming an inside cube corner, take any light that hits them and direct it back toward the source. Stimsonite reflectors are many, accurately-molded "three-mirror" cube corners, each of which returns the light from the driver's headlights directly to him.

Stimsonite reflectors stay bright indefinitely. The exposed surface is smooth . . . rain will keep it washed clean. It withstands severest exposure conditions with a minimum of maintenance because it's made of a single, durable material. No variety of components to deteriorate.

Stimsonite® *for* ***Seeability*** / ***Readability*** / ***Durability***

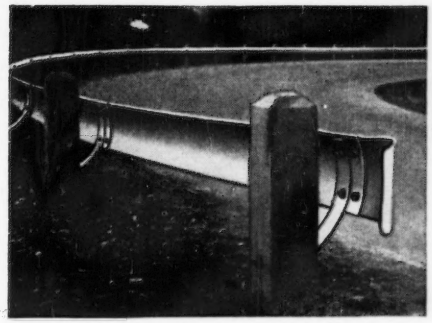
AGA Division of Elastic Stop Nut Corporation of America
1027 Newark Avenue, Elizabeth, N. J.

Purdue Announces New O-D Book

The Engineering Experiment Station of Purdue University recently announced the publication of COMPARISON OF TWO METHODS OF INTERNAL ORIGIN-DESTINATION SURVEYS: HOME INTERVIEW: AND CONTROLLED POST-CARD, by James H. Kell, MSCE.

This 158 page bulletin contains the results of a comparison analysis of the data collected by a home-interview origin-destination survey with the data from a post-card study. Both surveys were made at the same time in the same urban area and covered the complete city. The report contains a survey narrative, a large number of informative figures and tables, a statistical treatment of various factors that might affect the returns, a comprehensive discussion of the analysis, conclusions, and recommendations for further research.

The report is in bulletin form, size 6″ x 9″, and is priced at two dollars per copy. Copies may be ordered from: Director, Engineering Experiment Station, Purdue University, Lafayette, Indiana, with remittance payable to Purdue University.



SAFE!

TUTHILL HYWAY GUARD

Resilient convex steel rail safely deflects cars back on the road Low-mounted springs absorb impact, minimize damage to car and occupants

Maximum STRENGTH
Maximum DEFLECTION
Maximum VISIBILITY
Minimum COST . . .
Write Today For Brochure

TUTHILL SPRING CO.
760 W. Polk Street, Chicago 7, Illinois

Buetow Becomes New 3M President

Elevation of Herbert P. Buetow, executive vice-president in charge of finance, to the presidency of Minnesota Mining & Manufacturing Company was announced early in May by the board of directors.

He succeeds Richard P. Carlton who becomes vice-chairman of the executive committee.

Buetow joined 3M as auditor in 1926 and became controller in 1935. He was made treasurer and a director of the company in 1939 and has been an executive vice-president since 1949.

A native of St. Paul, Buetow has been active in civic and business affairs nationally and locally. He is a former vice-president of the Controllers Institute of America and a former trustee of the Controllership Foundation. He is president and a director of the First Merchants State Bank and a director of the First Trust Company, both of St. Paul. He has been a member of the Minnesota Governor's Advisory Council on Unemployment Compensation since 1945.

Carlton has been president of 3M since 1949. He applied for a job with 3M as a laboratory assistant in 1921, but was at first turned down because the company felt it could not afford to hire a man with a degree in engineering. Carlton argued that the company could not be without the services of men with his qualifications and agreed to work for the laboratory assistant's salary of $65.00 a month until he could prove his worth. Within a short time he was made responsible for quality control of all 3M products.

He was elected a vice-president and director of the company in 1929 and became executive vice-president in charge of manufacturing, engineering and research in 1948.

In announcing Buetow's election, William L. McKnight, board chairman, explained that for health reasons Carlton had asked to be relieved of the broad duties of president.

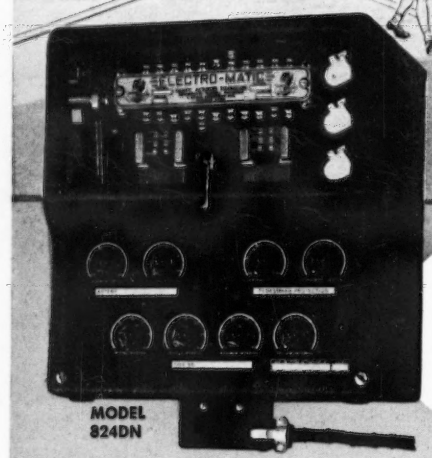
"In his new assignment Mr. Carlton will be free to continue his interest in research and product development, the areas in which he first distinguished himself, and in which he has made his greatest contributions to the company," McKnight said.

Through the years Carlton played a major role in developing the research, engineering and production organizations which resulted in the growth of the company's product list from a single item, sandpaper, in the mid-20's to more than 1,000 products today.

ITE CALENDAR

24th ANNUAL MEETING
Hotel Statler
Buffalo, New York
September 27 - October 1, 1953

25th ANNUAL MEETING
Kansas City, Missouri
September, 1954



Who can guess what a kid will do?

Children have a way of sauntering, running, playing, and daydreaming their way across an intersection. It's often safety-necessary to clear the intersection of vehicles. Then there are no cars to turn a corner to endanger young lives . . . and there's no danger of a child's daydreaming landing him in a hospital. Not only children but all pedestrians are endangered at these intersections where heavy vehicle turning movements are present.

ELECTRO-MATIC® MODEL 824DN DISPATCHER will provide an exclusive pedestrian interval, callable by push button actuation. WALK and clearance intervals are instantly knob-adjusted to desired length.

When pedestrian demand is not present the WALK interval does not appear in the cycle. The 824DN then functions as a semi-actuated dispatcher, right-of-way being normally maintained on the major street unless called to the minor street by vehicle actuation of the detectors.

The flexibility of full-actuated control combined with the advantage of a pedestrian WALK interval is obtainable by the ELECTRO-MATIC MODEL 825DN DISPATCHER.

To discover how these dispatchers can establish safe conditions at intersections, write for Bulletins 517 and 518.

TRAFFIC ACTUATED

Automatic Signal Division
EASTERN INDUSTRIES INCORPORATED
NORWALK, CONNECTICUT

® In Canada, Northern Electric Co., Ltd., Belleville, Ontario

BPR To Operate As Before, Says Secretary Weeks

"There is nothing intended or implied, so far as I know, . . . that in any way, shape or manner tends toward any watering down, so to speak, of the Bureau of Public Roads. My conception is that they will go on operating as they have, carrying out the program which is placed before them by the Congress and the President." This was the reply by Secretary of Commerce Sinclair Weeks recently, when asked by J. Harry McGregor (R., Ohio), Chairman of the House Roads Subcommittee, if any move to "close or hinder the activities of the BPR" was contemplated.

Robert B. Murray, Jr., Under Secretary of Commerce for Transportation, told a National Chamber of Commerce audience in Washington that a "management survey" of the Bureau of Public Roads by people outside of government is underway. Mr. Murray pointed out that, "today many proposals have been advanced for new Federal policies in the highway field. The diversity of suggested changes in policy is indicated in proposals to increase Federal participation in projects on the Interstate Systems, Federal-aid for toll road construction, to proposals to repeal the Federal excise taxes on motor fuels. It would be natural that the Federal role in highway aid would be examined in the light of overall administration policy regarding Federal-State relationships."

In other testimony before the Roads Subcommittee, Mr. Weeks said that at present he had no position on the question of Federal withdrawal from the field of motor fuel taxation, that such a decision must rest with Congress, that naturally, the Commerce Department's advice will be available at the appropriate time.

Representative James C. Auchincloss (R., N. J.) asked if the Commerce Secretary would recommend the advancing of Federal funds for toll road construction. Mr. Weeks replied, "Certainly, that is one of the items that should be looked into. Without knowing too much about toll roads, my conception has been that if they are put in the right place, they normally are self-liquidating, so to speak, and that the financing is readily available."

Farm and Municipal Leaders Testify

The Roads Subcommittee also heard Matt Triggs, Assistant Legislative Director of the American Farm Bureau Federation and Angus MacDonald of the National Farmers Union. Mr. Triggs said that the Farm Bureau Federation favors Federal withdrawal from the field of motor fuel taxation, but not until the Federal budget has been balanced. Mr. MacDonald said his organization does not seek such Federal withdrawal.

Municipal officials, appearing before the Subcommittee, included Chelsie J. Senerchia, Mayor of Miami, Florida; Glenn C. Richards, Detroit Superintendent of Public Works; W. R. Kellogg, City Manager of Cincinnati; Commissioner Virgil E. Gunlock of Chicago; George G. Hyland of the Boston Department of Public Works, and Ralph Gamble of Milwaukee Division of Expressways.

In his recommendations to the Subcommittee, Mayor Senerchia stated, "The legislation should include some provision which would make it mandatory upon the state governments to assign and earmark for the municipalities an equitable amount of Federal-aid funds, based either upon gasoline taxes collected by the state, or upon population. In this manner, the municipalities will be assured of improvements in their highway systems.

Mr. Richards told the Subcommittee that, "It is high time we, on all levels of government, agree upon a sound financing plan, based on physical studies rather than political expedience. We can no longer consider city streets, county, state and Federal roads, as individual problems. Only through the building of a balanced adequate, integrated national network of highways can we meet the demands of today's transportation needs."

Mr. Gunlock urged a 75-25 matching formula for Federal-aid urban projects, with the Federal Government bearing the larger share. Mr. Hyland recommended a supplemental Federal allocation for urban road development paid directly to municipalities.

Most city officials said they thought the Federal Government should continue to collect fuel taxes, that they believe they were faring better with Federal assistance than they would if the collection and disbursement of motor fuel tax revenue were left to the states.

Keeley Heads ARBA Committee

At a meeting held at the Edgewater Beach Hotel, Chicago, on April 13 and 14, the Committee on Traffic Control Devices of the American Road Builders Association elected as its chairman Armand E. Keeley (Mem., ITE), President of the Prismo Safety Corporation, Huntingdon, Pennsylvania.

The membership of the Committee on Traffic Control Devices is comprised of manufacturers of reflective markings and materials, for signs and highways, and is the national organization of the highway marking and signing industry.

Organized as a part of the Materials and Supplies Division of the A.R.B.A., in 1951, the Committee was formed for the purpose of providing a means by which the industry could work cooperatively with governmental agencies having jurisdiction over highway marking. The Committee's efforts have been directed toward promoting standardization of use and specifications on signs and markings as well as issuing technical bulletins and other data to promote increased highway safety.

Its membership served as the Industry Advisory Committee for the National Production Administration during the recent emergency, in 1951 and 1952, and was largely responsible for maintaining a high level of highway signing and marking, despite the critical shortage of materials during that period.

From the time the Committee on Traffic Control Devices was formed, Mr. Keeley has played an active part in its activities, having served as Vice-Chairman for two years. As President of the Prismo Safety Corporation—a firm which has pioneered consistently in the development and improvement of reflective markings—Mr. Keeley is well-qualified to assume leadership of the Committee's future efforts, in behalf of the industry and the American public at large.

In addition to the Institute of Traffic Engineers he is a member of the National Society of Professional Engineers, the American Society for Testing Materials, and is a Past President of the Engineers Society of Pennsylvania.

LETTERS TO THE EDITOR

Sir:

Your remarks on "changing drivers' attitudes" in the April issue of *Traffic Engineering*, page 252, are worth discussion. Attitude is one's disposition "appropriate to action."

We have two types of drivers—those who are intelligent and courteous and those who are not. Of the latter class there are the 12-year-olds, who have grown up; the criminally minded; and those temporarily in a "how came you so?" condition. There are many drivers whose only knowledge of a car is that certain gadgets make it go and others stop it. This is all that they want to know, or ever will know. This is their attitude, and you cannot change it.

With the rapidly increasing accident death rate, there will be many of these eliminated who would never be sane drivers. With the teaching of sane driving in public schools, there will gradually evolve a generation of intelligent and courteous drivers and a lessening of those who are not.

We are still a horse-and-buggy people. It is in our mores, and you cannot change the mores of a people in one or two generations.

G. H. Herrold (Mem., ITE)
2251 Hillside Avenue
St. Paul 8, Minnesota

Sir:

Effective May 1, contract arrangements have been completed for transferring the copyrights, printing and publication of our high school driver education textbook, "Man and the Motor Car", together with its supplementary materials, to Prentice Hall, Inc. We wanted to let you know about this immediately, and, more particularly, to tell you why we finally effected the transfer, what we hope to accomplish through it, and what this means as far as our continued role in the high school driver education movement is concerned.

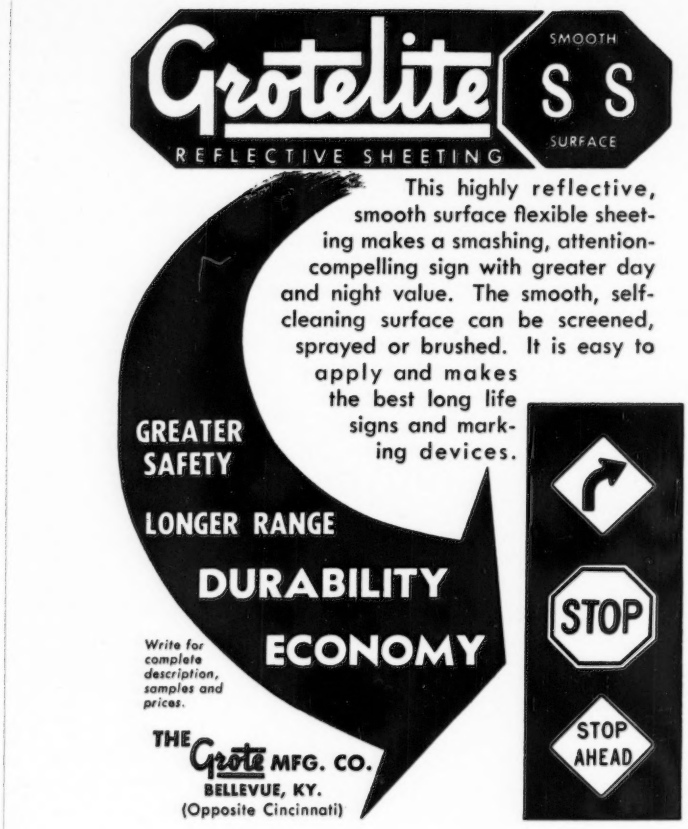
As you know, there are a number of important responsibilities involved in publishing, promoting, distributing and maintaining an educational textbook. These mount up to an undertaking of no small proportions, requiring a sizable allocation of staff time. With the continuous expansion of our "Man and the Motor Car" program, it finally became clear to us that we were beginning to exceed our facilities in trying to accommodate it properly, and that the time so spent might better be devoted to broadening and improving our educational services.

In addition, Prentice Hall, Inc. has wide experience and enjoys an excellent reputation in the secondary education textbook field. It has a number of useful educational services at its immediate disposal. It has a large and skilled staff, and can provide "Man and the Motor Car" with the support of an extensive field force. While our identification as the publishers of "Man and the Motor Car" has been a very gratifying one, we are pleased that it is now being taken over by an organization which is in a position to provide the book and its users with the facilities and services both need. And, as mentioned before, it is extremely important to us to have more staff time at our disposal for developing other useful driver education service functions. We hope that you agree with this reasoning.

We hold a very special feeling toward "Man and the Motor Car" and, in a certain sense, dislike very much seeing the responsibiyity for it pass out of our hands. It's been around with us for a long time—a part of our program since 1936; and it has seen some important driver education history made, perhaps more history than even the most ardent supporters of the idea, back in the early days of the movement, had hoped for. We think, too, that we owe "Man and the Motor Car" considerable thanks. It has done its job pretty well, and, in addition, has made it possible for us to make at least some small contribution to a cause in which we believe strongly.

This transfer will affect our current driver education program in no way except to permit us to broaden the scope of these services. We will continue our teacher-preparation activities, lending practical assistance in furthering the driver education movement whenever and however possible. And we hope to be able to place more emphasis on traffic safety education in its more general aspects. We shall continue to support widespread distribution and use of "Man and the Motor Car" and its related materials. Transfer of publication will in no way lessen our interest in either the textbook or the program.

We plan to work closely with Prentice Hall, Inc. All unterminated con-


Grotelite
REFLECTIVE SHEETING
SMOOTH
S S
SURFACE
This highly reflective, smooth surface flexible sheeting makes a smashing, attention-compelling sign with greater day and night value. The smooth, self-cleaning surface can be screened, sprayed or brushed. It is easy to apply and makes the best long life signs and marking devices.
GREATER SAFETY
LONGER RANGE
DURABILITY
ECONOMY
Write for complete description, samples and prices.
THE Grote MFG. CO.
BELLEVUE, KY.
(Opposite Cincinnati)
STOP
STOP AHEAD

tracts still existing between us and a state, county, local school board or book depository will be fulfilled according to the original agreement or through special arrangements satisfactory to all parties concerned.

We feel that the transfer of "Man and the Motor Car" marks the beginning of a new phase in our high school driver education effort, through which we hope to be of more effective service to you. We look forward, therefore, to receiving any suggestions you might have as to types of services appropriate for us to provide which you would find helpful in any phase of your program.

T. N. BOATE (Affil. Mem., ITE),
Manager
Accident Prevention Department.
Association of Casualty
and Surety Companies
60 John Street, New York City

Copell Joins Consultants

Mr. Edgar F. Copell (Mem. ITE) has recently joined the consulting engineering organization of DeLeuw, Cather & Company as Chief Engineer of the New England section. Offices have been established at 345 Boylston Street, Brookline, Massachusetts. Mr. Copell, until recently, was Commissioner of the Metropolitan District Commission with offices in Boston. He has been associated with the Commonwealth of Massachusetts in various capacities for 30 years, the longest tenure of office being as Traffic Engineer of the Department of Public Works.

He is also President of the Massachusetts Safety Council, a non-profit organization sponsored by industry and the insurance companies.

DeLeuw, Cather & Company is currently engaged by the Massachusetts Turnpike Authority in connection with the preparation of a traffic and revenues report on the proposed Massachusetts Turnpike. The organization specializes in the engineering of major civil works such as turnpikes, railroad grade separations, subways, and railroad facilities. They also engage in the design of industrial buildings, municipal facilities and public transportation systems, as well as in economic studies.

Please Mention
Traffic Engineering
When Writing to Advertisers

LOOKING AHEAD

JUNE 18-20, 1953—DAYTONA BEACH, FLA.
Annual Meeting, National Society of Professional Engineers, Sheraton-Beach Hotel.

JUNE 20-JULY 3, 1953—ATLANTIC CITY, N. J.
Summer General Meeting, American Institute of Electrical Engineers.

JUNE 28-JULY 2, 1953—LOS ANGELES, CALIF.
Semi-Annual Meeting, American Society of Mechanical Engineers, Statler Hotel.

AUGUST 10-12, 1953—LOS ANGELES, CALIF.
Annual Meeting, American Transit Association, Hotel Biltmore.

SEPTEMBER 14-18, 1953—NEW YORK CITY
Annual Meeting, Illuminating Engineering Society, Hotel Commodore.

SEPTEMBER 28-OCTOBER 1, 1953 — BUFFALO, N. Y.
24th Annual Meeting, Institute of Traffic Engineers, Hotel Statler.

OCTOBER 5-8, 1953—COLUMBUS, OHIO
58th Annual Meeting, International Municipal Signal Association, The Neil House.

This New Miro-Flex Sign MAKES 'EM STOP!

DAY OR NIGHT

This new 24" Miro-Flex STOP sign presents a clear command, day or night. Embossed center panel is black enamel finished, has wide-angle reflectorized letters. Miro-Flex signs meet U.S. Public Road Administration standards, are embossed on zinc-coated, bonderized steel, finished in magnetically sprayed baked enamel for long life, and are available plain or reflectorized. Write for catalog on complete sign line.

ACTUAL NIGHT PHOTOGRAPH

THE MIRO-FLEX CO., INC.
1824 EAST SECOND STREET
WICHITA, KANSAS

SECTION NEWS

Michigan Section

The Michigan Section of the Institute of Traffic Engineers held its annual election of officers on Thursday, May 7th, at a dinner meeting held at the Warren Valley Country Club in Dearborn, Michigan.

Mr. S. J. Levine of Mt. Clemens was elected president; Mr. Sven Kansman of Detroit, vice-president, and Mr. Edward F. Gervais of Lansing, secretary-treasurer.

Captain Harold Hickman, Traffic Engineer for the City of Flint, will be in charge of the June program, which will be held in Flint.

Midwest Section

*Clipped from the monthly newsletter ITE*MS for May 1953:*

U. of Illinois Students Visit Chicago

On April 16, the Midwest Section was host to Prof. John Leek and the members of the University of Illinois Student Chapter of ITE. The group spent the day touring various traffic installations in Chicago, including the master traffic signal control panel in City Hall, Edens Expressway, the North Outer Drive during the rush hour change-over to unbalanced lane operation, and the site of the new underground parking garage under construction.

The day was climaxed with participation in the monthly meeting of the Midwest Section. Highlight of the evening was a lively panel discussion of Chicago's traffic problems. The panel—moderated by Bill Marston—consisted of Vic Hofer, Dick Fencl, Evan Olmstead, and Ralph Michel. A variety of questions were fired at these intrepid panelists by the students and by Section members.

Among the items discussed were signs, signals, parking, accidents, relationships between various agencies, unbalanced lane operation and office procedure. Special interest was expressed in the Grant Park Underground Garage and in the phenomenon of the Chicago Park District within the City of Chicago.

A note of thanks to the Chicago Motor Club boys who provided transportation from Champaign to Chicago, and return—and who provided lively service for our visitors on their Chicago tour.

* * *

Cook County Highway Department has undertaken the major task of inventorying its entire system. Data such as signs, roadway widths, and pavement types and traffic volumes are being determined.

Milwaukee Bound

Section members' response to the trip to Milwaukee on May 22 was so great that a larger bus had to be ordered and reservations closed. According to the route map and itinerary John Zimmerman is sending to the lucky ticket holders a well-planned and enjoyable day is in the offing. It includes transportation via Greyhound's experimental "Scenic Cruiser" (complete with glass top and rest room), refreshments enroute, a tour of Milwaukee (highlighted by traffic engineering emphasis), a visit through and a buffet dinner at the Miller Brewing Co., a technical session acquainting us with the traffic problems and improvements in Milwaukee, and a "Gemuetlichkeit Period". Some define this word "gemuetlichkeit" as meaning beer, questions, beer, discussions, and more beer. Departure from Milwaukee is slated for about 11:00 P.M. Chicago time.

John would appreciate it if ticket holders would return the questionnaire (dealing with where each traveler intends to board the bus) promptly so that final arrangements can be completed.

Annual ITE Outing Planned For June

Woodstock, Ill. (ITE)—Residents of this northern Illinois community are bracing themselves for the annual onslaught of traffic engineers from various parts of the midwest. The encampment will occur on Wednesday, June 24, starting at 8-9 A.M., at Woodmar, which is located several miles to the east.

The tentative schedule calls for diversified activities including golf, swimming, baseball, horseshoes, tiddlywinks, cards, and what have you. In addition there will be meals and refreshments through the day.

The finances needed include $1.50 greens fees, $2.50 for lunch and $1.50 for the evening "hamburger fry". Tickets will be on sale shortly. Participants in the outing will include MALE members of M. W. ITE.

* * *

This is credited to an old prof at Cornell, via C. C. Wiley:

"Be sure you are right, then go ahead. If not sure you are right go ahead anyway. For godsake do *something*."

Editorial—Thanks, and Help!

We don't look for them, but a pat on the back feels good when you have completed a tough job. Many thanks to all those who have told us they liked our first issue of Midwest ITE*MS. But we especially want to express thanks to Ralph Gross, Prof. Wiley and Tim Todd, who went to all the trouble to write us letters of congratulations.

No, we are not looking for praise. We are, however, looking for something. We want news, notes, personals, jokes, cartoons—anything which might be of interest to our readers. We want constructive criticism—what do you like and what don't you like about ITE*MS, and why.

This paper does not belong to anyone. It is a group effort for the benefit of all of us. It isn't your paper and it isn't mine—it's ours. A few of us have been selected as volunteers to do the mechanical part of the job, but all of us must contribute in order to do a complete job. Thanks, and h e l p ! !

* * *

Pet Peeve?

The guy who burns me up is he
Who gives his horn a blast
And nearly crowds me off the road
As he goes racing past.
Then, when he's gone about a block,
(This makes me mad as hops)
He swings sharply to the right,
Pulls up to the curb—and stops!

We don't know much about automotive engineering but we have noticed that girls with streamlined shapes offer less resistance to hot air.

* * *

Puzzle Corner

Last month's tin question marks go to Dick Walons, Mike Powills and—all the way from New Haven—Tim Todd for sending in the correct solution to our multiplication problem. We expected a few more replies but maybe some of our readers thought it looked too easy. In case you got stuck, here is the problem and the solution:

ABCDEF	145386
x3	x3
BDFACE	436158

Last month we presented a problem that looked fairly simple but turned out to be a little stinker. This month we are doing an about face and giving you just the opposite kind of a deal. If you don't get this one in 60 seconds, you might just as well give up.

Your car and a bicycle 20 miles apart are traveling towards each other. Your car is traveling uniformly at 45 MPH and the bike at 15 MPH. A bewildered

bird is flying back and forth in a straight line between the front of your car and the front of the bike. The bird's speed is 45 MPH all the time.

If car, bike, and bird all start at the same time, how many miles does the bird fly until your car and the bike meet?

* * *

One of the best ways to get rid of the noise in the rear of your car is to have her sit up front with you.

* * *

Midwest ITE to Co-Sponsor Two Seminars for Traffic Engineers At Northwestern

To help meet the training needs of practicing traffic engineers, the Midwest Section of ITE and the Traffic Institute of Northwestern University will sponsor two Seminars in Traffic Engineering in Evanston the week of July 6.

The Seminars will be held during the Traffic Institute's annual Summer Institute for Traffic Training which includes 12 courses for persons working in the traffic field, including school teachers, newspaper men, motor fleet supervisors, chemical testers and police.

The ITE believes these Seminars are of great value, presenting younger ITE members an opportunity to obtain additional professional knowledge, and offering more experienced members a review as well as introducing them to new techniques. Members who attended Unit One last year were highly enthusiastic.

Unit One, Traffic Engineering Field Study and Survey Methods, is open to all qualified engineers. It covers: vehicle volume, speed, parking, origin-destination and accident analyses.

Unit Two, Traffic Regulation and Control Devices, is open to men who have completed Unit One and others meeting requirements. It covers: traffic signals and signal systems, one-way streets, channelization, sign and marking methods, transit operating problems, and curb parking regulation. Fee for both courses is $50.

George Barton will coordinate the seminars. Adrian Koert will assist him. Members of the ITE qualified on particular subjects will serve as instructors.

Write to George Barton at The Traffic Institute, 1704 Judson, Evanston, Ill., for more information.

* * *

"No, son—fluid drive in a car is not the same thing as a drip driver."

Reported by S. T. Siegel
Chairman, Publications Committee

ITE Sustaining Organizations

Having complied with all requirements of Article XI of the By-Laws, a certificate as SUSTAINING ORGANIZATION of the Institute of Traffic Engineers for 1953 has been issued to the following organizations:

A'G'A Division of Elastic Stop Nut Corporation of America
1027 Newark Avenue — Elizabeth 3, New Jersey
Irving J. Mack, *Representaitve*

American Transit Association
292 Madison Avenue — New York 17, New York
George W. Anderson, *Representative*

The Marbelite Company, Inc.
27 Warren Street — New York 7, New York
William E. Lenz, *Representative*

Miro-Flex Company, Inc.
1824 East Second Street — Wichita, Kansas
H. N. Carver, *Representative*

Prismo Safety Corporation
Huntingdon — Pennsylvania
John C. Horn, *Representative*

Reflexite Corporation
114 Manhattan Street — Stamford, Connecticut
W. Burke Smith, *Representative*

Traffic & Street Sign Company
84 Foundry Street — Newark 5, New Jersey
William H. Spurgeon, *Representative*

New York Metropolitan Section

The fifth (dinner) meeting of the New York Metropolitan Section was held at the President Tavern on April 28, 1953, at 6:30 P.M. Thirty members and guests were present, including six students from the Yale Bureau for Highway Traffic.

Mr. Nathan Cherniack, national past president of the institute, opened the meeting with an expression of sorrow at the untimely death of Mr. W. Graham Cole, member of the New York Metropolitan Section. Mr. Cherniack then read an obituary to Mr. Cole written by the Metropolitan Life Insurance Company, where he had served as assistant secretary. After the reading of the obituary, a motion was made by Mr. Cherniack, duly seconded and unanimously passed, that, Mr. Edmund Ricker, President of the Section, write a note of sympathy and condolence to the family of Mr. Cole. The members present then observed a minute of silence in memory of Mr. Cole.

Mr. Ricker spoke about the possibility of holding the last meeting of the Section in June as an outing, as has been done in the past. It was decided to circularize the membership of the section in the next meeting announcement to find out the sentiment of the membership with reference to such an outing.

Mr. Arnold Fisch, of the New York Thruway Authority, then requested that members of the section, who plan to be present at the annual meeting of the Institute in Buffalo this fall, and who are familiar with members of the Institute from other parts of the country, volunteer on the committee to greet incoming members to the annual meeting.

Mr. Ricker then proposed that a general invitation be extended by the New York Section to the New England Section to participate in the annual outing meeting of the New York Metropolitan Section, if such an outing is held.

The speaker of the meeting, Mr. John Rhoades, of the American Gas Accumulator Division of the Elastic Nut and Bolt Corporation gave a very informative and interesting talk on the proposed revisions of the Uniform Manual on Sign Standards of the A.A.S.H.O. Mr. Rhoades made the point that the question of sign standards should not be confused with standard signs. He explained that a standard sign refers to the matter of copy and size.

The changes proposed in sign standards refer to size of sign, shape, color of background and copy, size of letters and stroke size, reflectorization and illumination, height of setting and setback from edge of pavement.

A discussion followed Mr. Rhoades' talk on such questions as target value of signs, visibility before readability, letter types, and importance of sign shapes as symbol signs in the education of the motorist.

The meeting adjourned about 10:30 P.M. The next (luncheon) meeting will be held on May 27, 1953.

Reported by Nathan Avins
Secretary-Treasurer

Western Section

From the April newsletter Western ITE.

Conference

The Sixth Annual Conference of the Western Section, Institute of Traffic Engineers, promises to be the most outstanding to date. The number of preregistration forms that have been received at this writing indicates we are going to have a large turnout from all the eleven western states. Get aboard the band wagon and set your sites for the Seattle meeting May 21 and 22. An interesting, educational, and entertaining time is promised to all those in attendance.

From the Denver Area

Al Pepper was pleasantly surprised to find featured in the February issue of the "South African Municipal Magazine", mailed to him recently from Johannesburg, a generous reprint and two-column editorial on an article he supplied last year for "American Highways" entitled "Traffic Engineering for Small Municipalities." Seems that all the darkness hasn't yet been dispelled from the urban centers on the dark continent, for traffic officials in the Union of South Africa are having trouble convincing municipalities that there's a lot more to traffic engineering than a "blahsted" sign or a "blinkin" signal light. The Secretary of Transport suggested the use of Al's account of traffic engineering services for small communities to help enlighten public opinion and acquaint local jurisdictions with the true stature of the profession. The South African Municipal Magazine, two shillings sixpence a copy, is the oldest municipal journal in Africa and is devoted to issues and affairs in the field of public works, roads and transport.

It's round-up time in Colorado for ITE members and recruits! Al Pepper reports that Jack Bruce has turned true Western cowboy and is roaming the Columbine range to rope and corral the scattered herd bearing the ITE brand for a Spring feed and bull session. First get-together of the Colorado group is tentatively planned for the last week in April at which time Hank Barnes will spin a few yarns about his experiences in the City of Baltimore. Bruce hopes that regular meetings of the Colorado members can be arranged after that.

To the above John Bruce adds: Hank Barnes arrived back in Denver after completing his consulting job for the City of Baltimore. With him were Jim Rudden and Gerry Rothweiler, who had met Hank in New York at Automatic Signal Corporation headquarters for the purpose of going over signal equipment needs for the possible extension of the Denver Master Control System.

The Denver Area Traffic Engineers and their guests were scheduled to have a dinner meeting at the Democratic Club at 7:00 P.M. on April 29. Attendance is expected to reach 20 or more people.

Los Angeles Area

WesternITE's roving reporter, one Skinny DeYoung, put in an appearance at Olympia after attending an Oregon Area meeting in Portland. Skinny left immediately for Chicago, but stopped long enough to impart the following gems of journalism.

Seymour (Sam) Taylor has been made Traffic Engineer for Salt Lake City.

Bill Miller of Fort Worth is on a steady consulting job on the City of Abilene, Texas.

Tom Willier has set up swanky offices in the Commerce Building in Houston, and is going great guns.

The grapevine has it that Texas is still thinking of starting up its own section.

Mrs. DeYoung's son, Skinny, is expected to make a poor showing at his tennis demonstration in Seattle.

Harry Parker, Area Chairman, writes that Ed Telford, recently appointed District Engineer of the State Division of Highways, spoke on state highway operation before 29 members and friends of the Institute at a dinner meeting held March 31. . . . With the able assistance of Al Hutchison, who acted as projectionist pro tem, Mr. Telford, presented some very interesting material showing sources of revenue for state highways, apportionment of disbursements to the various political subdivisions in California, and the organizations of the State Division of Highways.

Guy McDonald, following Joe Havenner's recent example, retired to the hospital for an operation. Lest the foregoing be misunderstood, it should be added that "Mac" is able to sit down.

The Los Angeles Area's next meeting will take place May 7. Professor Amos Neyhard, Chief of the Institute of Public Safety at Penn State, will be the principal speaker.

Oregon Area

The Oregon Area held its April meeting at Berg's Chalet in Portland on Friday, April 17. Jim Gallagher, Traffic Engineer for the Washington's Vancouver district, gave an excellent presentation of free-way plans and design in and around Vancouver.

Bud George and Carlton Robinson reported that the dinner meeting preceded by the children's hour was highly successful, and even drew many of the Washington Area members to Portland.

Bay Area

Norm Kennedy will pinch-hit for Harmer Davis at the forthcoming Traffic Engineering Conference in Seattle. Norm, who is well qualified in the matter of toll road investigation, will give an address on "Some Consideration in Toll Road Analysis." Harmer, representing President Sproul, is required to be in the east during the time of the conference.

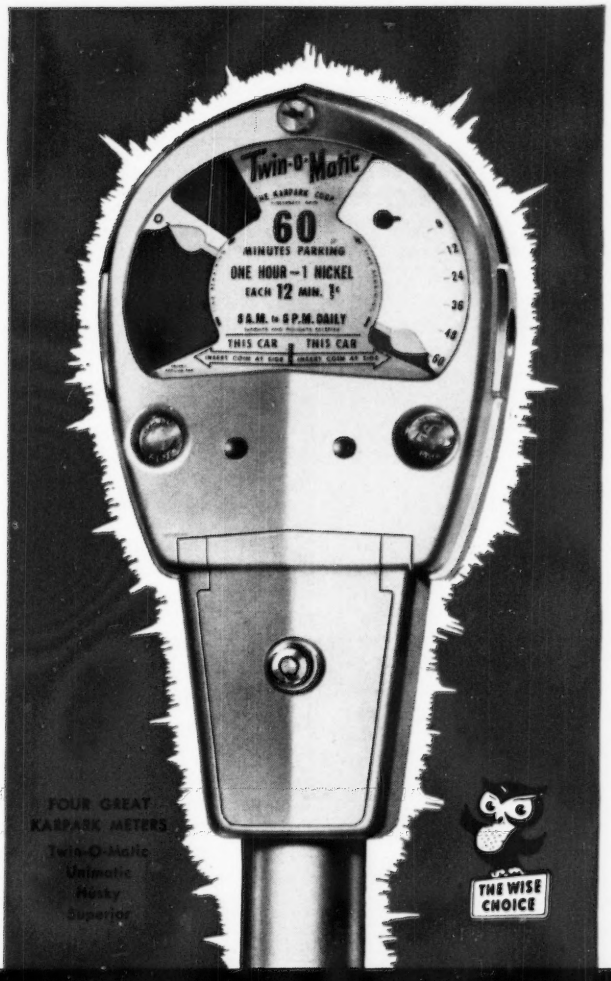
Bob Graver with the Public Safety Department, California State Automobile Association, writes that he has the dates of May 21 and 22 well marked on his calendar. Unfortunately, he states they are not marked for the annual W.I.T.E. meeting, but rather for a two weeks tour of active duty in Uncle Sam's Army.

New Member

Doug Carmody, Traffic Engineer, Alameda County Courthouse, Oakland, joined the ranks of the Western Section as a junior member. Our congratulations to Doug.

*I.T.E.*M.S.*

The mid-west section has given birth to a monthly news-letter. Starting with the April issue, Volume 1, No. 1, the mid-west section ITE, will publish a monthly digest of activities. The Publication Committee headed by Ted Seigel got off to a good start in his April issue, and we look forward to swapping news with the mid-west section.



extra care pays off

Taking extra trouble prevents trouble. Day in, day out, Karparks keep on the go. There are no complaints about timing or breakdowns. Maintenance is slight. The reason: Years of experience in meeting the standards of high precision work have made rigorous exactness a habit — in engineering, in crafting Karpark meters. Details like machine cut shafts, pinions and gears, precise hobbing, rigidly specified materials pay off in reliability. While Karparks have every worthwhile feature, fine craftsmanship wins the votes of far-seeing officials.

Now Obtainable—The Versatile

Twin-O-Matic

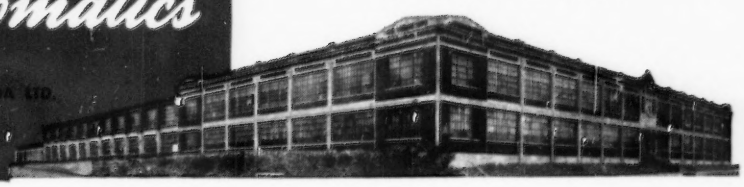
Here's the last word in parking meter adaptability and installation economy. More materials make it possible to supply more of these sensational meters. Write for data.

THE KARPARK CORPORATION • CINCINNATI 6, OHIO

KARPARK *Automatics*

IN CANADA
TWIN METER CO. OF CANADA LTD.
1224 Osgoode Street
Montreal 22, Que.

Karparks are manufactured by
THE HERSCHEDE HALL CLOCK COMPANY —
makers of America's finest clocks



Washington Area

It is reported that Jerry Cysewski is having the same kind of trouble that Al Head experienced a few months ago, namely secretary trouble. We offer no comments on this situation, but apparently his last three secretaries would rather have babies than take dictation.

Bob Dunn is now a full-fledged television actor. He recently appeared over KING T.V. in a brief demonstration of a disaster truck, in connection with civilian defense.

Herb Higgins (who says it is work) will vacation next month at Harrison, Hot Springs.

Bob Schmidt is conducting a cordon count of the Tacoma Central Business District.

Johnny Mladinov is having his hands full these days writing up old traffic surveys and conducting new ones.

Alaskan Way Viaduct

Seattle's latest traffic improvement, a six-lane, two-level viaduct, bypassing the business district, is enjoying considerable popularity. During the first full day of operations, some 50,000 vehicles made use of it. A week after it opened, the $8,000,000 structure was carrying an average of 30,000 vehicles a day. Before and after studies are being made on the viaduct to determine the extent of diversion and the amount of induced and generated traffic.

Reported by W. H. Carsten
Secretary-Treasurer

Washington, D. C., Section

The May 20 meeting of the Washington Section attended by 34 members and guests featured the election of officers for the coming year as well as a roundtable discussion on one-way streets and public transit.

The following were elected: Gordon Gravelle, President; Henry Evans, Vice-President; Burton Sexton, Secretary-Treasurer.

A special committee was appointed to look into the matter of inviting the 1955 ITE Annual Meeting to Washington, D. C. Also it was announced that the annual outing will take place on Saturday, June 20 at O. K. Normann's suburban home where swimming and various other sports will precede the usual gastronomic deluging.

Reported by Henry K. Evans
Secretary-Treasurer

New England Section

The Annual Meeting of the New England Section was held at the Cow Shed Restaurant on May 19th in East Hartford, Connecticut. Thirty-three members and guests gathered over a roast beef dinner to hear Edmund R. Ricker, Traffic Engineer for the New Jersey Turnpike Authority, discuss the operational problems of toll plazas and the approach designs of the same. Prior to the talk by the guest speaker, President Hugh Wynn requested Past President Robert Mitchell to announce the nominations of officers for the 1953-54 year. Mr. Mitchell announced that ballots would be distributed to the membership which must be returned by June 1st. The nominations offered by the nominating committee were as follows: President, Robert Williston; Vice-President, Earl H. Flynn; Secretary-Treasurer, Fred Hurd.

Pinch hitting for Membership Committee Chairman Robert Williston, Earl Flynn reported that 10 new members for the National ITE had submitted application blanks to the Board of Direction. The quota for the New England Section is 30 new members. In response to a request from Mr. Flynn, Tim Todd, National Executive Secretary reported that across the country the various sections were filling about one-third of their assigned quotas in the membership drive.

Robert Mitchell also presented a petition signed by a number of Connecticut members of the Section requesting endorsement by the Section for the assignment of the National ITE Convention in 1955 to Hartford, Connecticut. He reported that the apparent feeling was that the 1955 Convention should be returned to New England with Hartford as a preferable location. However, any other New England city would undoubtedly be strongly supported by the petitioners. Tim Todd then advised the Section as to the responsibility and expenses involved in conducting a National Convention. The members are to be polled that the Board of Direction of the National ITE may be advised as to the wishes of the Section prior to August 1st, 1953.

Hugh Wynn then spoke briefly about the possibilities of a summer outing to be held jointly with the New York Section. Ed Ricker offered an unofficial invitation to the Section members individually to attend. A summer outing to be held at Travers Island, New Rochelle, New York, is now in the planning stage by the New York Section. Mr. Ricker indicated that plans are not yet complete for that outing but that the Section would be advised in the event that the New York Section proceeds with its tentative plans. He recommended that hereafter each Section plan its own summer outing and extend an invitation to the members of the adjacent section. The planning of a joint outing is too complicated with the miles of travel involved. However, it is not impossible or improper that certain members of each section would find it pleasureable to join with the members of the New York Section in a summer outing if it is possible to attend. Mr. Wynn requested the Secretary to advise the New England Section membership accordingly, should they be interested in the possible invitation to the New York Section outing. Mr. Ricker was then "officially" introduced as the guest speaker of the evening.

Ed Ricker was formerly a President of the New England Section and is now President of the New York Section. Following his introduction he proceeded to take the Secretary of the New England Section to task for attempting to hang on to members that had become members of the New York Section since acquiring residence or employment in the New York area. He explained that a former member of the New England Section now working in New York is now officially a member of the New York Section having been tendered a free lunch but that the New England Section still mailed announcements of its meetings to said transfer member! (The Secretary is considering a petition to someone to investigate subsidizing of Section members.)

Launching into his discussion of toll plazas operations, Mr. Ricker described the various devices required for the operation of a toll collection system. Prepunched cards for machine accounting are furnished each collector to correspond to the exits at which they work. The New Jersey Turnpike provides only access or egress through a toll booth. As a consequences, the daily tabulation of these cards gives a fairly accurate daily O & D survey with respect to the travel between any combination of exits.

He reports an unusual phenomena in that the Turnpike experiences a modest number of rear end collisions at its southerly end where the toll booth and gate is visible for an exceptional distance whereas the toll booth at the north end of the Turnpike which is over a hill and has a relatively poor approach plaza experiences few if any accidents.

It is his presumption that despite lighting, signs and other devices to warn motorists, highway hypnosis seriously affects drivers on the Turnpike. It has been found desirable to tie in maintenance areas with interchanges in order to eliminate the necessity for cross overs of the medial strip or other conflicts with normal vehicular traffic. It has been found that smooth flow ramps are desirable at toll booth locations and must be designated in such a fashion that the largest number of streams of traffic will be directed at the largest number of toll booths. Left hand toll booth collection systems require special approach designs. However, they have been found preferable to right hand collection booths due to the speed of operation. The New York Port Authority reports collections at a rate of 450 tolls per hour with left hand units in contrast to 350 per hour with right hand units.

The booths of the toll collectors on the New Jersey Turnpike system are equipped with both radio telephones and wire telephones as a means of protection. Concrete barriers are also erected in front of each booth.

There apparently is an open field for the study of toll booth design. Regardless of all the devices that have been tried to date, rain still blows in, making the job of the toll collector uncomfortable during bad weather. The New Jersey Turnpike Toll Plaza Administration Buildings include locker rooms for the collectors and practically every other facility required for the 24 hour day operation of the Turnpike. At this season of the year approximately 165 collectors are employed, in the operation of the Turnpike. It has been found that the interchange ramps will feed only two lanes of traffic successfully through the toll booths allowing access by 700 vehicles per hour maximum and egress by 250 vehicles per hour. Recently the Turnpike Commission adopted a minimum speed limit of 35 miles per hour for level grades. Any vehicle mechanically incapable of maintaining this speed is prohibited from using the Turnpike. Presently in the Camden district about 35,000 vehicles a day use the Turnpike. Traffic on Route 25 in this same area dropped from approximately 80,000 to 70,000 upon opening of the Turnpike but is now climbing toward the 80,000 mark again. It has been found that the diversion pattern adjacent to a new facility such as the Turnpike is remarkable as drivers will proceed some distance out of their way in order to save time. Time is undoubtedly the measure of convenience today rather than mileage. A short question and answer period followed the talk by Mr. Ricker and would have lasted far into the night had not a halt been called.

Reported by Earl H. Flynn
Secretary-Treasurer

ON THE SHELF

Compiled by
Mrs. Cele Kagan, Acting Librarian
Yale Bureau of Highway Traffic

Massachusetts. Boston. City Planning Board.

Preliminary Report on a General Plan for Boston. (Cover reads: General Plan for Boston: Preliminary Report — 1950). The Board, 1951. 63pp.

A series of findings and recommendations in business and industry, residence, schools and recreation and transportation in the city of Boston.

National Highway Users Conference.

Diversion, an Enemy of Good Roads. The Conference, Washington 4, D. C., 1952. 26pp.

This report shows clearly the problems arising from diversion and contains sections of Congressional Acts illustrating the Federal Government's "opposition toward improper use of motor vehicle funds." In addition to general governmental taxes the highway user is responsible for special motor-vehicle taxes which the author states should not be diverted from the intended purpose.

New York, New York. Department of Traffic.

Annual Report, 1951. 30pp.

A report on the activities of the Department of Traffic for the period from its creation on June 7, 1950, to June 30, 1951.

North Dakota. Legislative Research Committee.

Better Laws Are Basic to Better Highways; An Analysis of the State Highway Laws of North Dakota and Recommendations for Their Improvement. The Committee, prepared by the Automotive Safety Foundation with the cooperation of the North Dakota State Highway Department, 1953. 81pp.

Contains: Recommendations; General Problem; The North Dakota Law—Conclusions and Findings; Recommended State Highway Law for North Dakota.

Oregon. State Highway Department. Traffic Engineering Division.

One-Way Street Routing on Urban Highways in Oregon. The Division. 1951. 30pp., mimeo.

This study compiles data, in regard to the result obtained from the various one-way couplets, as an assessment of the value of such couplets and provides a means of evaluating the benefits which might be obtained from future installations.

Over-the-Hill Parking, Inc.

An Outline of "OVER-THE-HILL PARKING." A New Idea to Help Solve MUNICIPAL PARKING PROBLEMS as Originated and Developed in Nashville, Tennessee. Over-the-Hill Parking, Inc., 1951. 28pp.

A new program to eliminate parking and congestion in the downtown area by a driving service that calls for the vehicle and returns it on request through a communications system established in several shopping places.

U. S. Department of Commerce, Bureau of Public Roads.

Highways in the United States. The Bureau, Washington, 1951. 22pp.

An historical developmental treatment of the U. S. highways.

Western Association of State Highway Officials.

Second Annual Highway Planning Conference. The California Division of Highways and U. S. Bureau of Public Roads, 1951. 52pp.

Oshkosh, Wisconsin, City Planning Commission.

An Integrated Street System for Oshkosh, Wisconsin. The Commission, n.d. 31pp.

Report of the general course and capacity of each major thoroughfare.

The Council of State Governments.

Highway Legislation in 1951. The Council, 1313 East 60th St., Chicago 37, Illinois. 1951. 24pp. $.50.

A summary of highway legislation supplementary to the Council's comprehensive report entitled *Highway Safety —Motor Truck Regulation.*

Skid Resistance Measurements. Reprint by the Western Association of State Highway Officials (Reprint No. 10). Distributed by California University. Institute of Transportation and Traffic Engineering. 1952.

The results of the tests indicate at least 15 factors which introduce variations in the skid resistance: speed, surface condition, type of aggregate, type and amount of asphalt, method of construction, surface smoothness, surface texture, traffic volume and weight, oil drippings, heavy rains, age and weathering effect on surface, type of tire, type and condition of brakes, method of braking and air pavement tempera-

Secretary's Column

No sooner had my statement appeared that last month's column was my twelfth than one or two mathematically minded members reminded me that it was not the twelfth — it was only the eleventh since I'd skipped the column last September. In rebuttal, I'll say that while I did skip the Secretary's Column, I wrote the Frankly Speaking page for that issue and therefore should be credited with no strikeouts in twelve times at bat.

On May 27 I was privileged to sit down with the Staff of the Yale Bureau of Highway Traffic and the 1953 class of 20 men in a final graduation luncheon. The Chairman of the Committee on Transportation (the Bureau's Governing Board) Professor Kent Healy and Samuel Dudley, Dean Emeritus of the Engineering School, were in attendance.

The principal speaker was Mr. Pike Johnson, President of the Automotive Safety Foundation, the organization that has aided so many fine young men to receive training from the Bureau during the past two decades.

Mr. Johnson's theme, most inspiringly pressed home, might be paraphrased as being of the *walk tall, stand tall, think tall variety*. Never has the need for constructive solutions to growing traffic and congestion problems been so pressing. He quoted statistics showing that each year a quarter trillion vehicle miles are run up on the urban streets alone—which comprise less than 10% of the nation's highway system—and since World War II only about 5000 miles of urban streets have been built or rebuilt. He pointed out that intolerable congestion was everywhere apparent even on the furthermost reaches of the rural system. He warned that conditions are steadily growing worse; since the war the cities, states and Federal Government have constructed only 109,000 miles of highways, much of which was replacement only, while in the same length of time the automobile manufacturers have produced a line of vehicles bumper to bumper 139,000 miles long!

He cautioned the new traffic engineers to always think responsibly and constructively, so that the benefit to our American way of life would be the item of paramount importance rather than the benefit to any particular segment as for example the motor car owners, the parking lot operators or the pedestrians. Restrictive measures are to be countenanced only when the total benefit materially exceeds the penalty.

He believes that the present day traffic engineers have opportunities as never before to make their marks, because the public has been conditioned for the benefits of traffic engineering. This is because of the growing public appreciation of the problem, a resultant demand for solution and an appreciation of the simple fact that engineers can invariably obtain better utilization of existing facilities.

* * *

For many years we've been proud of the fact that the membership of "Miss" —in the person of Margaret Woolverton, who always gave our single members (and some of the married ones too!) heart palpitations at the Annual Meetings. Apparently she tired of being the only Miss in the Institute, for word has just reached us that on May 4th she became Mrs. Robert H. Savage. Her address remains the same; Quinton Engineers, Ltd., 812 West Eighth Street, Los Angeles 17, California.

Since we all know that Traffic Engineers make the *best marital mates* in the world we are especially sincere in extending our heartiest congratu'ations to the lucky Mr. Savage.

TIM TODD

ON THE SHELF

(Continued from page 331)

ture. The tests further indicate that the greatest skidding hazard is encountered when braking a car equipped with smooth-tread tires with all wheels locked or sliding on a wet bleeding asphalt surface or a highly polished p.c. concrete surface.

Highway Research Board.

Off-Street Parking: Legislative Trends Administration Agencies. (Bulletin No. 48, summary report). Presented at the thirty-first annual meeting, 1952. The Board, 1952.

Contents: "Trends in Legislation for Off-Street Parking," David R. Levin; "Provisions for Financing of Parking Facilities in Cities by Means of Bonds"; "Effectiveness of Parking Agencies," David R. Levin.

A continuous looseleaf collation of facts, figures, formulae, techniques and procedures in the field of traffic engineering designed as a supplement to the Traffic Engineering Handbook.

Minnesota. Department of Highways. Highway Planning Survey.

Minnesota Rural Truck Highway Accident, Access Point and Advertising Sign Study. The Department, in cooperation with the U. S. Bureau of Public Roads, 1952 (Revised, 1952). 38pp.

The study has proved that various roadway elements and roadside features, alone or in combination, make varying degrees of contribution to accident occurrence, and that the magnitude or frequency of these characteristics governs the extent to which accident potential is generated.

New Haven, Connecticut. Capital Budget Programming Committee.

New Haven's Program for Public Improvements, 1953-1958. The Committee, 1952. Unpaged, pamphlet.

Taff, Charles A.

Commercial Motor Transportation. Richard D. Irwin, Inc., Chicago, Illinois, 1951. 413pp. $5.50.

A broad account of the industry and an analysis of the pertinent factual information. Part I outlines the scope of motor transportation and the highway system; Part II: Property carrying aspects of commercial motor transportation; and Part III: Passenger-carrying aspects of commercial motor transportation.

Richmond, California. Department of Public Works (State). The Planning Division.

The Parking Problem in the Central Business District. The Department, 1952. 26pp.

This is the second preliminary report on the need for off-street parking in the Central Business District. It explains the social and economic importance of the Central Business District and the need for adequate, permanent parking facilities. It discusses the problem of parking, the experiences of leaders, several types of financing and describes in general the results of the Traffic Survey which was conducted on November 15, 1951.

Position Available

CITY OF ABILENE, TEXAS
TRAFFIC ENGINEER
To organize new division to deal with traffic engineering duties, planning and zoning work in a city of about 60,000.
Apply:
MR. AUSTIN P. HANCOCK
CITY MANAGER
City Hall
Abilene, Texas

Professional Service Directory

PALMER AND BAKER, INC.
CONSULTING ENGINEERS — ARCHITECTS
NAVAL ARCHITECTS — MARINE ENGINEERS
Surveys — Reports — Design — Supervision — Consultation
Transportation and Traffic Problems Tunnels Bridges Highways Airports
Industrial Buildings Waterfront and Harbor Structures
Graving and Floating Dry Docks Vessels, Boats and Floating Equipment
Complete Soils, Materials and Chemical Laboratories
Mobile, Ala. New Orleans, La. Houston, Texas Washington, D. C.

GANNETT FLEMING CORDDRY and CARPENTER, INC.
---ENGINEERS---
CONSULTING SERVICE FOR TRAFFIC, PARKING and TRANSPORTATION PROBLEMS
City Planning — Highways — Bridges — Flood Control
Water Supply — Sewerage — Industrial Waste — Garbage Disposal
Appraisals — Investigations — Management
600 NO. 2nd STREET HARRISBURG, PA.
Pittsburgh, Pa. Scranton, Pa. Daytona Beach, Fla. Medellin, Colombia, S. A.

EDWARDS, KELCEY and BECK
CONSULTING ENGINEERS
Surveys — Reports — Economic Studies — Design — Supervision
Transportation — Traffic — Parking — Terminals — Port and Harbor Works
Highways — Expressways — Grade Separations — Tunnels
Bridges — Water Supply — Management
3 William Street, Newark 2, N. J. • 250 Park Avenue, New York 17, N. Y.

RAMP BUILDINGS CORPORATION
PLANNING CONSULTANT
SINCE 1920
PARKING & AUTOMOTIVE SERVICE FACILITIES
MUNICIPAL PROGRAMS PRIVATE PROJECTS
Surveys — Reports — Design — Economics — Finance — Appraisals
230 Park Avenue :: New York 17, N. Y.

YOUR CARD
could be set in this space at a very reasonable rate.
If interested, please write:
TRAFFIC ENGINEERING
211 Strathcona Hall
New Haven 11, Connecticut

Highway Traffic Engineers, Inc.
345 Boylston Street
Brookline 46, Massachusetts
LOngwood 6-0275

PARSONS, BRINCKERHOFF HALL & MACDONALD
Engineers
Bridges, Highways, Tunnels, Airports, Traffic and Transportation Reports, Subways, Harbor Works, Dams, Canals, Power Projects, Industrial Buildings, Housing, Sewerage and Water Supply.
51 Broadway New York 6, N. Y.

DE LEUW, CATHER & COMPANY
CONSULTING ENGINEERS
Transportation, Public Transit and Traffic Problems
Subways, Railroads, Industrial Plants Power Plants, Grade Separations, Expressways, Tunnels, Municipal Works
150 N. Wacker Drive, Chicago 6, Ill.
79 McAllister St., San Francisco 2, Cal.

JENKINS, MERCHANT & NANKIVIL
Consulting Engineers
Municipal Improvements Sewerage
Power Development Water Systems
Traffic Surveys Industrial Plants
Flood Control Recreational Facilities
Airports Investigations and Reports
805 East Miller Street
Springfield, Illinois

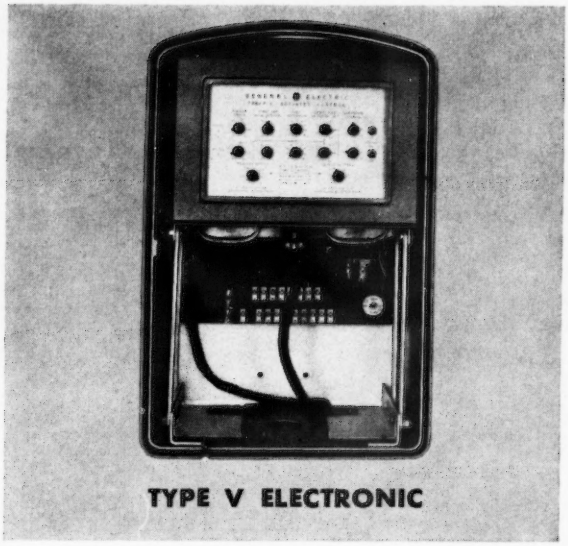
AMMANN & WHITNEY
CONSULTING ENGINEERS
Design & Construction Supervision
Bridges, Buildings, Industrial Plants, Special Structures, Foundations, Airport Facilities, Expressways
76 Ninth Avenue, New York 11, N. Y.
724 E. Mason Street, Milwaukee 2, Wis.

MATTHEW CAREY
MUNICIPAL FINANCE CONSULTANT
Specializing in Financing
Off Street Parking Facilities
Financial Advisor in Connection with Highland Park, Royal Oak, Wyandotte, Michigan and Kankakee, Illinois Automobile Parking System Revenue Bond Issues
Box 3703 Kercheval Station
Detroit 15, Michigan

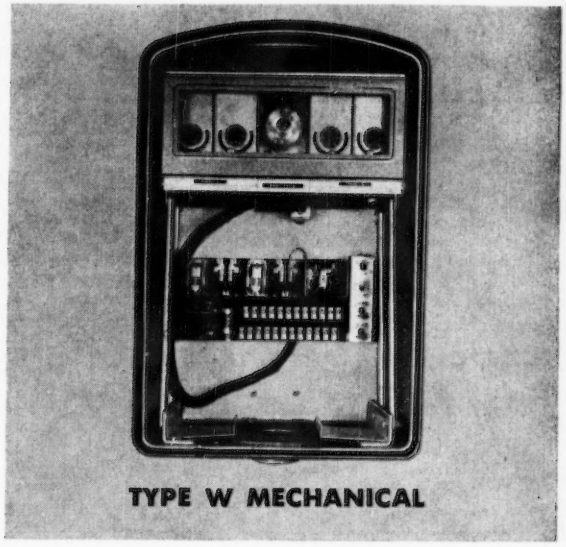
Index to Advertisers

The revenue derived from the sale of advertising space assists the **Institute** in publishing TRAFFIC ENGINEERING on a regular monthly basis. The manufacturers listed below will be glad to cooperate with products and services which will be helpful to you in developing your traffic engineering and public improvement program.

A'G'A DIVISION OF ELASTIC STOP NUT CORP.	320	MI-CO METERS	297
AUTOMATIC SIGNAL DIVISION	322	MINNESOTA MINING & MANUFACTURING CO.	Inside Front Cover
DUAL PARKING METER COMPANY	300	MIRO-FLEX COMPANY, INC.	325
DUNCAN PARKING METER CORPORATION	319	PRISMO SAFETY CORPORATION	302
GENERAL ELECTRIC	Back Cover	TUTHILL SPRING COMPANY	321
GROTE MANUFACTURING CO., INC.	324	WALD INDUSTRIES, INC.	298
KARPARK CORPORATION	329		



TYPE V ELECTRONIC



TYPE W MECHANICAL

G.E. Announces Two Types of Vehicle Actuated Controllers

SIMPLICITY OF JACK-MOUNTING AND UNITIZED CONSTRUCTION ASSURE FAST, EASY MAINTENANCE

Simplicity of components, pioneered in the famous G-E Type F Controller, is extended to G.E.'s two types of vehicle actuated controllers. The electronic Type V, employing new, simplified electronic timing circuits, offers signal timing more advanced and efficient than previously available. Exclusive "service-minded" design features, both electrical and mechanical, make the Type V Controllers attractive to the novice as well as those experienced in the vehicle-actuated field.

The Type W Controller was developed upon popular demand for an electro-mechanical type of actuated controller. It uses primary basic parts such as the timing dial units and signal drum assembly, mechanically identical to those of the Type F Pre-timed Controller.

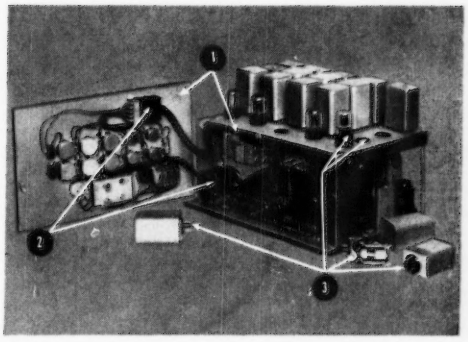
SIMPLE MAINTENANCE. Both the Type V and Type W use standard jack-mounted, unitized components, all readily accessible, assuring faster, easier, more simple and less costly maintenance. Both types are available in semi- and fully-actuated models.

MORE INFORMATION in greater detail is yours for the asking. See your nearest G-E Apparatus Sales Office or Traffic Control Distributor. Or write for Bulletin GEC-941. Address Section 453-59, General Electric Company, Schenectady 5, N. Y.

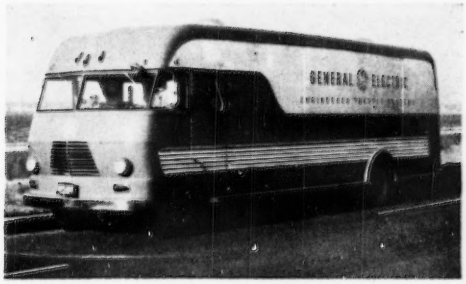
1878 75 1953
YEARS OF ELECTRICAL PROGRESS

You can put your confidence in—

GENERAL ELECTRIC



NO TOOLS are needed for servicing. Hinged construction (1) of front and top panels provides quick accessibility to all components. Plugs (2) permit quick removal of front and top panel units from timer base. All tubes and relays (3) are jack-mounted. Pantograph mounted table allows complete timer to swing out of cabinet without affecting operation.



SEE THE TRAFFIC DISPLAY COACH! With exhibits that enable you to create typical traffic problems, plus the latest in traffic control equipment, this mobile G-E exhibit is touring the country now. Don't miss it!